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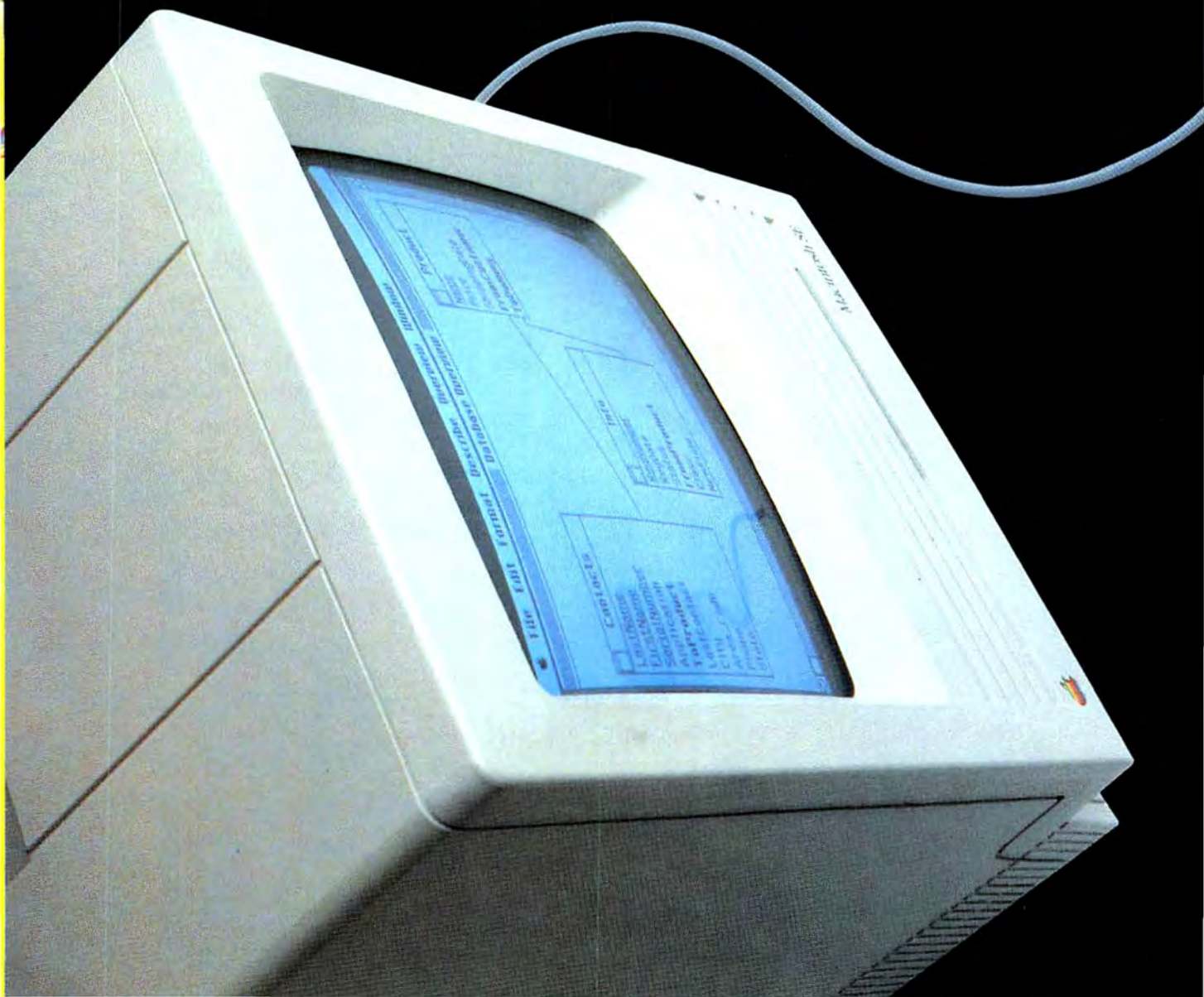
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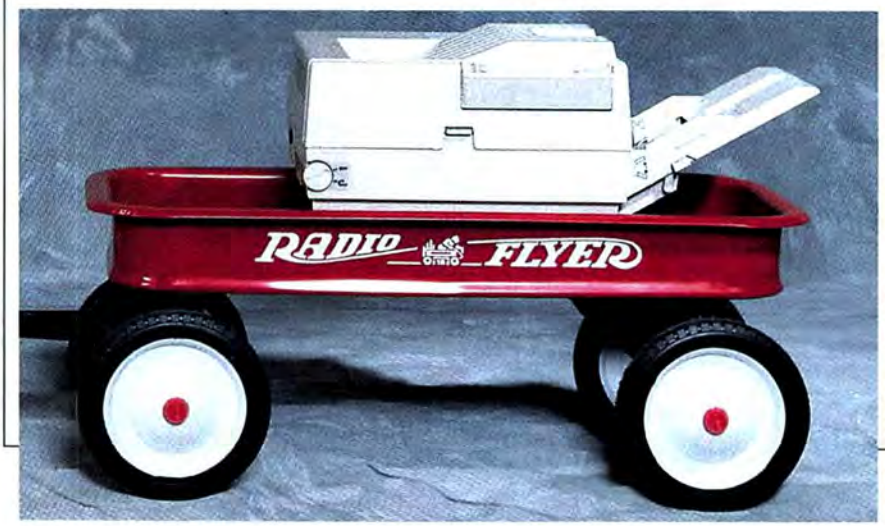
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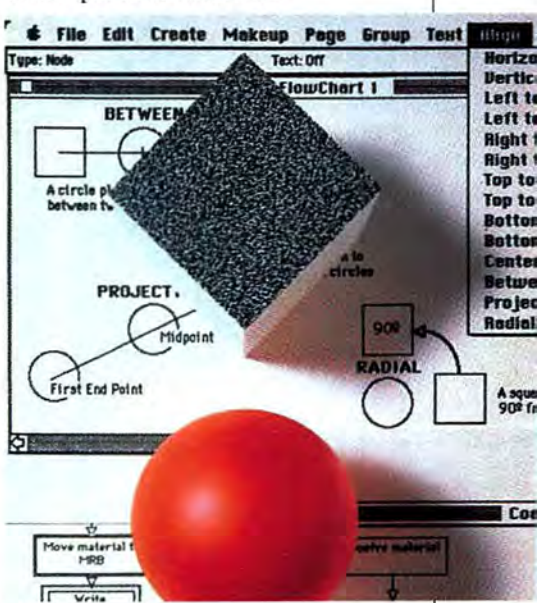


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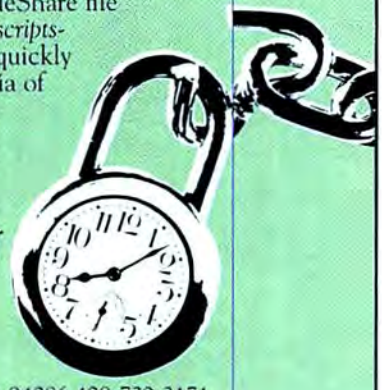


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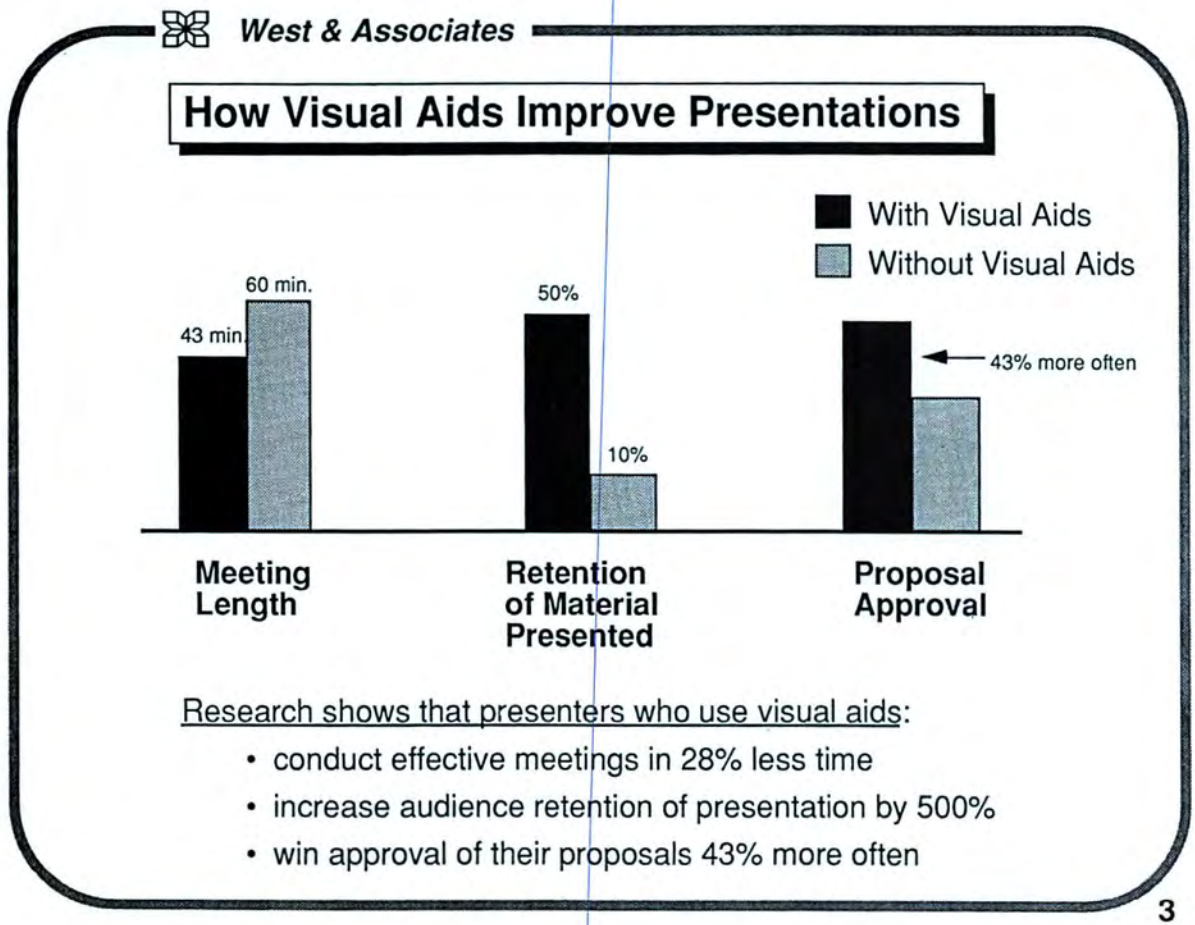
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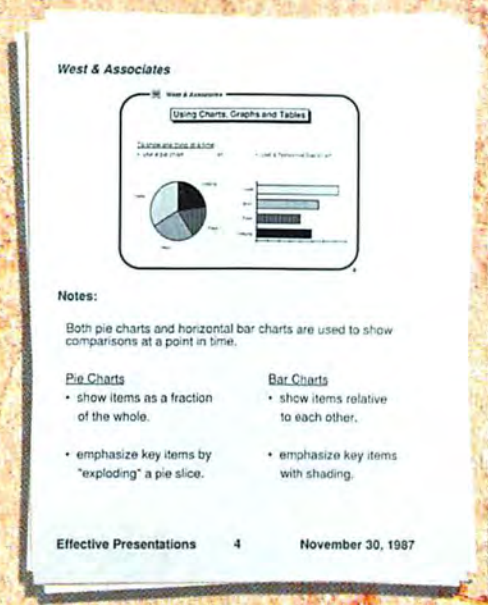
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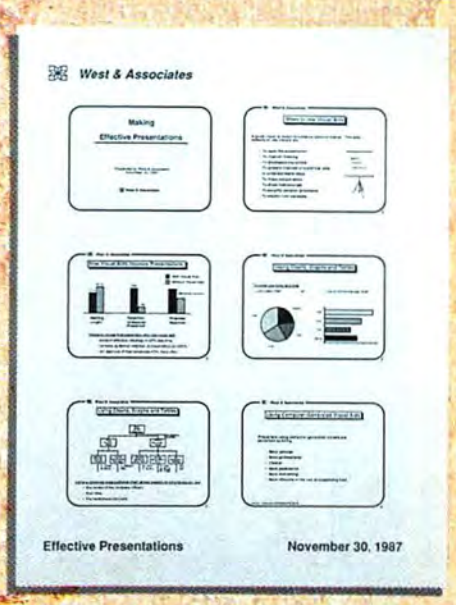
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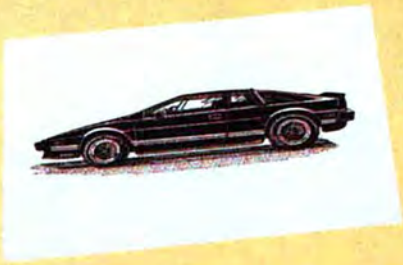
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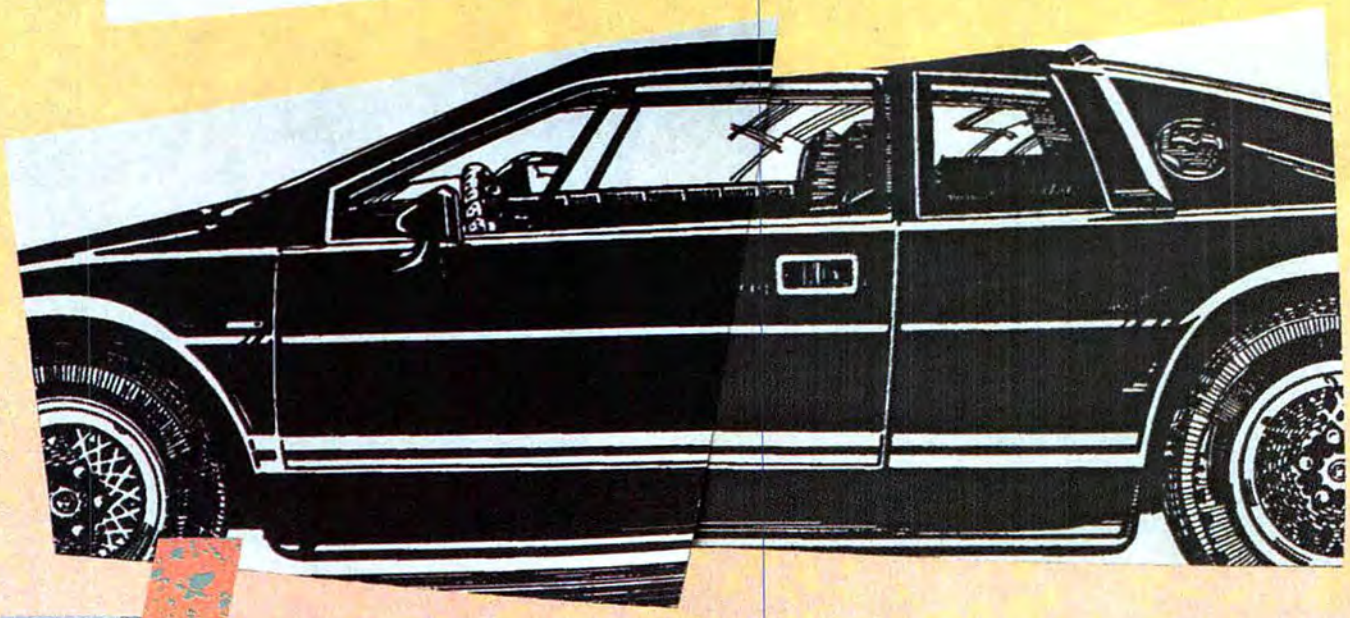
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ntroducing the PostScript laser printer that blacks out at high speeds.

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by Steven Bobker

Crimes of the Heart

Yet another Macworld Expo has come and gone. The predominant feelings are bigness and déjà vu. The show keeps expanding, seemingly even faster than the marketplace. Last year it filled half of San Francisco's Moscone Center, a big hall. (The other half was the whole annual boat show.) This year Mac products filled the whole space. Rumor has it that next year the show will take all of Moscone and all of Brooks Hall (about a mile away). We already know that this coming August's Boston show will be split between Bayside and the World Trade Center, two not-so-great halls separated by a couple of miles of bad roads. In a town with inadequate public transport (in those areas) and far too few cabs, that's a prescription for a mess. The Mac community is getting so big that one hall (at least in San Francisco and Boston) can't hold us anymore.

No one, neither attendees nor exhibitors is looking forward to these split hall shows. The prospect of spending so much time getting to and from (and between) the halls is daunting. Eventually these major shows must move to larger halls. New York City, Chicago and Las Vegas come to mind. While those places may not be the Mac hotbeds that Boston and San Francisco are, they do have adequate facilities. Unfortunately, major shows can't be moved casually, as halls get booked up years in advance. Still, it's time to start thinking about a move (or moves). If Mitch Hall, the current management company, can't do it, someone else should step in. The thought of competing Mac shows excites me. Just as magazine competition has led to better magazines, so show competition should lead to much better shows.

The déjà vu feeling was that of promises. Lots of hardware and software was promised and shown, but you can't buy it yet (even now as you read this). I saw at least a half dozen booths that were pushing products that exist only in the imagination. I'd guess they were testing concepts and possibly hoping to line up capital. They sure weren't selling products.

The most spectacular booth (by a long shot) was the *Wingz* booth. *Wingz* is a product that sort of exists. It's a great wish list and there are some neat screens in it — you got to see a lot of them if you waited in line and stood through the high tech demo. I'd bet what I saw in that demo was a *VideoWorks II* show, though. Nice, but not real. People would have lined up to see the demo even without Leonard Nimoy (Mr. Spock) and the attraction of a free (and very nice) nylon bag on the way out. This big splash, for a product you might — or might not — see this year, cost between $300,000 and $500,000 (the figures are based on our investigations at the show). That seems to be what it takes to challenge the big boys; in this case, *Excel*. The publisher says *Wingz* will be out in a few months (they were showing a version of the actual program that did a few things in a hotel ballroom). I think that same place, next year might be a lot more realistic.



In this trend toward big splashes the Mac market is following the IBM market. Cheap product introductions are a thing of the past. Major products require major marketing efforts (and bucks). That's inevitable and can be taken as a sign of the Mac's maturity. But it's also a sad waste of money and effort. And if it shuts out a worthy product by a small company, it's bad. One result of the need for money was a spate of rumors about companies buying smaller companies or their products. The most widespread was that Ashton-Tate was going to buy *FullWrite Professional* for megamillions. Maybe that will have happened by the time you read this. It didn't happen at the show; at least I don't think it did.

FullWrite Professional is a name that should bring tears to your eyes. It may well be the ultimate word processing program, if it ever ships. The promises that it was in duplication and would be on sale at the show proved empty. There are still problems. Ann Arbor gave out 10,000 (their claim) demo copies and shipped that version to all those who had preordered and prepaid. They hope to have the final version out by the time you read this. I can't suggest you bet on that however.

The demo is nice (I still think this will be a great program one day), but it's not the ultimate solution. Using only the parts of it that work properly gives you a much greater appreciation of *Word*. The *Word* way might not be nice, but it is best in many cases.

Handing out demos to stave off the masses and shipping beta copies (with the promise of an automatic free upgrade) was a fairly common ploy. The first company that I can remember doing this was Silicon Beach with *SuperPaint* last year. Microsoft did it with *Word 3.0* even if they won't admit to it and WordPerfect did it with *WordPerfect* here.

It's a terrible idea. For one thing, beta software may not be very stable (I can crash my copy of *FullWrite* in numerous ways) and you shouldn't use it without care and knowledge. I shudder to think of a relatively naive user getting one of these betas, installing it on a server and wiping out a workgroup. If you must use beta software, back up often, try to keep the thing off hard disks (that's not always possible in these days of 700K+ programs) and always be aware of what you're dealing with.

The best rule is to let someone else

BELINDA MORRISSEY

do the testing. Don't be an unwilling tester. And certainly don't pay for the privilege.

Having said that I have to admit that my personal show favorites were not shipping. The hardware I liked best was Ergotron's new workstation stand that gets your Mac or Mac II up off your desk and lets you put it front and center to work or away when you do old-fashioned traditional things on your desk (you know: drink coffee, do crossword puzzles and read the paper). Ergotron's solution is both elegant and flexible. It should start to ship around now. The price is expected to be about $500.

The program I liked best is a word processor you probably haven't heard of. It's called *Nisus* and is being developed by Paragon Concepts. *Nisus* owes its roots to Paragon's *QUED* and will have all of that wonderful program's features and then some. It should rival *FullWrite Professional, WordPerfect* and *Word* for sheer number of features. And since it was designed by people with lots of heavy-duty editor experience it's going to be a wordsmith's dream. Of course, it's way behind schedule (having originally been promised for mid-1987). I hope we'll see it by August. It already looks worth waiting for.

MOVING ON

Two months ago I claimed that *Red Ryder* was the first telecommunications program to properly deal with big screens. Almost everyone missed the error in that claim. However, my good friend Dennis Brothers pointed out that *Microphone,* which he happens to have written, handled big screens and printing to the LaserWriter properly, long before *Red Ryder* did. Sorry, Dennis, I don't know how I could have forgotten that. And our show report in that same issue incorrectly gave *Red Ryder* credit for an Eddy award in our first round of awards. It didn't win that year; *Smartcom II* did, and I should have known that because *Smartcom* was the telecommunications program I used then and is the telecommunications program I use now.

Speaking of Eddys, some folks have been abusing the awards. These awards are for the best *new* products in their categories. They never have claimed to be the ultimate best of a category. When you see an award mentioned in an advertisement the word "New" should be there and the year should be mentioned as well.

A particularly egregious example is the claim in Bravo Technologies' ads for its *MacCalc* spreadsheet that it is "The Best Spreadsheet — MacUser Editor's Choice Award." It's not the best spreadsheet. Poll our editors or any reasonable sample and you'll discover that honor still belongs to *Excel. MacCalc* was the best new product in its class in 1986. That's all. We neither want to censor ads nor do we have the ability to do so, so things like this will happen. We can and do request that the offending ads or promotional materials be fixed, but we have limited power there. However, I can and will bring matters like this to your attention and ask you to vote with your pocketbook if the ad is not corrected. *MacCalc* is a fine product; it doesn't need misrepresentation to sell.

When you see an Eddy award mentioned in an advertisement the word "New" should be there and the year should be mentioned as well.

Yet more on this year's Eddy awards. The most controversial choice seems to have been the award for best new programming language for programmers to Apple's *MPW.* Lots of programmers expressed their displeasure with that selection. Almost all of those who thought we were wrong thought that the award should have gone to Think Technologies' *Lightspeed C,* version 2.0. I can't say I wholly disagree. Probably more major Mac programs have been written in *Lightspeed C* than in any other language.

MPW still has its share of defenders, however, and, as a group, our editors preferred it. Next year may well be different, though, as *Lightspeed* will soon go to version 3.0, a major improvement on an already great program.

TRY THAT AGAIN, PLEASE

The stackware rage continues unabated. In the February issue of *The MACazine,* the editor announced that he is going to publish stackware. I don't doubt it'll be good stuff. However, the announcement goes on to say that not only will he publish it, but *The MACazine* will review it! Using, of course, freelance reviewers who have no financial interest in the products. I sure hope so. I sure hope that that fine sentiment applies to all their reviewers of all the the products they review. It does at *MacUser.* That claim of noninvolvement seems to beg another issue. These freelance reviewers might want to write other articles and reviews for the editor. What do you think a bad review of one of the editor's products will do for the freelancer's chances? Writers need to be totally independent so they can tell the truth, be it good or bad news.

The announcement also seems to indicate that all of the editor's own stackware will be reviewed. That's nice. In a world where there are too many products to cover them all, selecting which products to review and which not to is every bit as important as the reviews themselves.

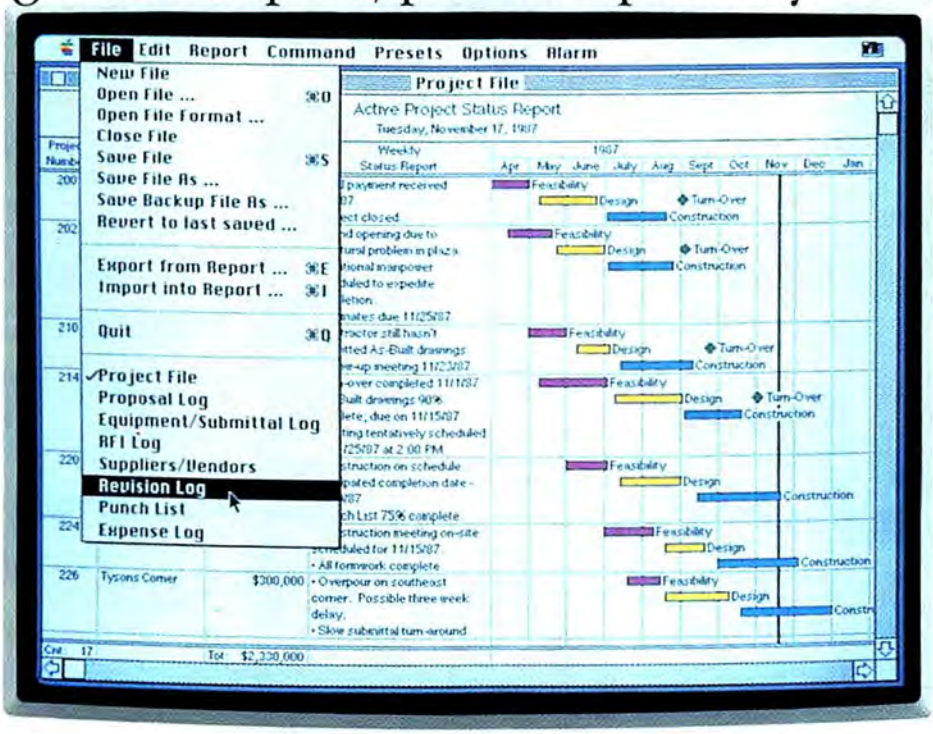
Publishing software and then reviewing it seems very near the height of hypocrisy. But since I'm sure *The MACazine* will do an excellent job of covering its editor's own products, I hope you won't be offended if we just ignore them and give the rest of the stackware developers a fair shake.

SMALL IS BEAUTIFUL, PART 2

Last month I mentioned several small companies that publish great software. Here are some products from small companies that are worth looking for.

Affinity Microsystems of Boulder,

Before the day is over, you'll be expected to track 651 submittals, update 3 project schedules, approve 27 change orders, organize 517 bits of new information, make 312 separate decisions, create an up-to-the-minute bar graph showing your project's actual progress and give a complete, printed report to your boss.



Fortunately, you have AEC Information Manager.™

Introducing AEC Information Manager, the flexible, user-definable software designed specifically for the management and tracking of projects, activities, documents, scheduled processes and people.

With AEC Information Manager you can create on-screen and hard-copy reports from your data instantly, using report formats that you can easily define to suit your particular needs. And you can combine columnar and graphic data in the same report, while also supporting color display and printing. Plus, AEC Information Manager updates related reports automatically whenever new data is entered.

Programmable alarms, custom work schedules, note pads, time dependent fields, automatic calculations for start dates, finish dates and durations, and powerful reporting and graphing capabilities make it possible to monitor and manage *any* amount of information. And because AEC Information Manager was designed exclusively for the Macintosh, it's intuitively easy to use, requiring no special programming skills.

That's just part of what AEC Information Manager can do. To find out more, call 1-800-346-9413, today for our FREE information kit. Or, for just $25,* we'll send you our demo disk and manual.



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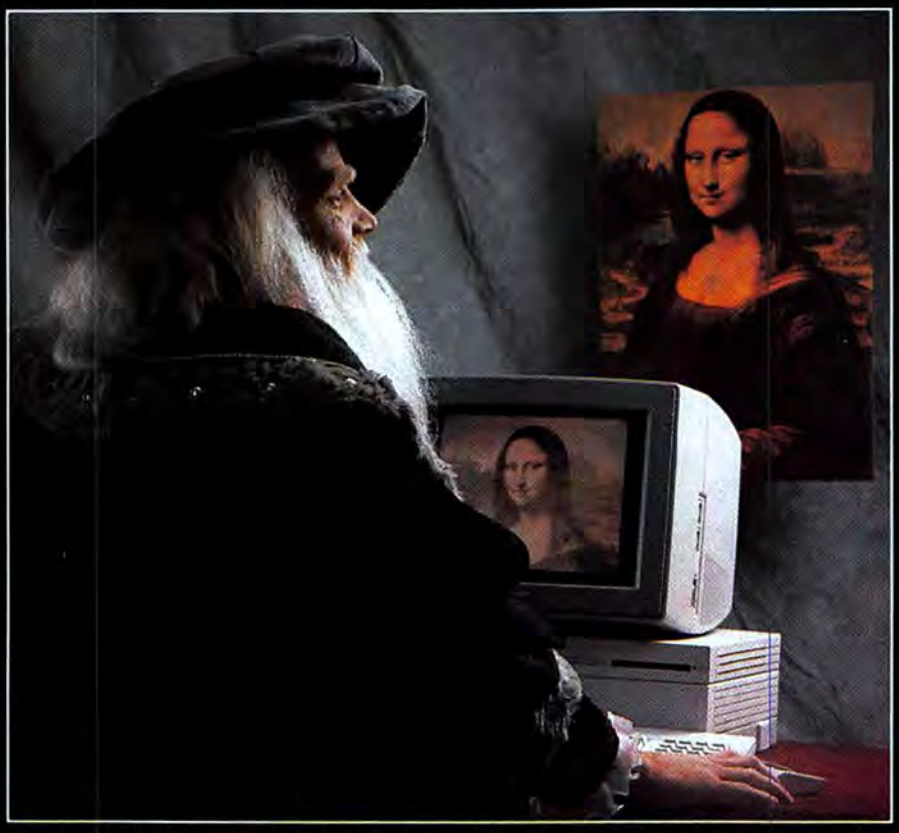
AEC Information Manager operates on Mac Plus, Mac SE and Mac II computers, or any Macintosh computer with 1 Megabyte of memory. AEC Information Manager prints out on all Apple ImageWriter and LaserWriter printers, and can support color plotters.

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Colorado publishes the excellent *Tempo II* macro creator and runner, and the handy and elegant *Affini-File.* ALSoft of Spring, Texas publishes *Disk Express,* a super hard disk utility and *Font/DA Juggler Plus,* a superb program with a tongue twister of a name. In many ways it is superior to the current version of *Suitcase* (mentioned last month).

Bech-Tech of Berkeley, California has an excellent presentation tool in *MacMovies.* It has been used for several sequences shown on national television. CasadyWare of Carmel, California produces superb fonts for both your ImageWriter and your LaserWriter.

FullWrite Professional is a name that should bring tears to your eyes. It may well be the ultimate word processing program, if it ever ships.

Cortland Computer of Berkeley, California publishes a wonderful (and award-winning) set of desk accessories that goes beyond most others. It's definitely worth a look. Dove, of Wilmington, North Carolina, is not really that small, but isn't widely known. If you need more memory (and who doesn't these days), think Dove.

Paragon Concepts of Del Mar, California is best know for the *QUED/M* editor, but has a whole list of nice products. They may become a large company when the *Nisus* word processor mentioned above ships. Mainstay, of Agoura Hills, California, has an extensive line of small, but very useful programs. Check out *Think 'n Time* and *MacSchedule.*

I'll continue this list next month. Meanwhile, if you have a favorite small publisher, let me know about them.

A technological breakthrough for using your Mac data disks in a PC.

Turn a PC 3.5″ drive into a PC/Mac drive for only $159.

Now it's easy for the Macintosh and PC to share files. Installed in an IBM PS/2 Model 30 (or a 100% PC or AT compatible with an internal 3.5″ drive), the new **Copy II™ PC Deluxe Option Board** allows the PC to read and write Macintosh data diskettes directly.

A low-cost, state-of-the-art solution—no "extra" drives, serial cables or network needed.

Using the latest ASIC technology integrated in a half-size card, the Copy II PC Deluxe Option Board **transforms a PC's internal 3.5″ drive into a dual-purpose Mac/IBM compatible drive. For hundreds of dollars less.**

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All you do is pop a Mac data disk into the PC's internal 3.5″ drive and go.

Easy to use.

PC users already know how to use Mac disks in a PC. The commands are virtually identical to DOS—they simply add an "M" for Mac before each one. "COPY" becomes "MCOPY," "DIR" becomes "MDIR," etc. It's really that simple.



Works with all the great Macintosh and PC programs.

Now share Mac data files with a PC running IBM versions of popular Mac programs like **Pagemaker, Excel, dBASE Mac, and Microsoft Word. Lotus 1-2-3** will even read Mac Excel spreadsheets directly. What's more, switching back to the Mac is easy. The PC's files are simply copied back to the Mac disk.

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With the Copy II PC Deluxe Option Board, Mac and PC users can share data quickly and easily—for a lot less money than you would pay for a network or add-on Mac drives. **There's simply no easier, less expensive way to transfer data from Macs to PCs. Or vice versa.**

Bridge the gap.

Teach a PC to read Mac files. For the dealer nearest you, or to order direct, **call (503) 244-6036,** M-F, 8 a.m.-5 p.m. (West Coast time). Please specify computer make and model when ordering. Compaq Portable, HP Vectra and Tandy 1000 require extra $15 cable. Questions? Call us at (503) 244-5782.



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patrick chédal C&C



by Neil L. Shapiro

Having Fun Is No Crime

But laughter is a weakness, corruption, the foolishness of our flesh. It is the peasant's entertainment, the drunkard's license; even the church in her wisdom has granted the moment of feast, carnival, fair, this diurnal pollution that releases humors and remains base, a defense for the simple, a mystery desecrated for the plebeians."

The above quote is from the book (certainly not the movie) *The Name of the Rose* by Umberto Eco, and my mind returned to it over and over again during a discussion I had with some on-line friends concerning Apple's *HyperCard* program. The remark was made by the monk, Jorge, who has murdered numerous fellow monks in an attempt to stop anyone from reading the second book of the *Poetics* of Aristotle. Now lost to us, also thanks to the fictional machinations of Jorge, this fabled volume, according to Eco's novel, explained Aristotle's viewpoint that laughter is both healthy and holy. Many times during this on-line discussion I wished that I had access to such a volume.

What is laughter?
What is fun?
What is work?
What is *serious work*?

If you think that all of this philosophizing has little to do with the Mac, you're wrong. I don't think that there are any more important questions that anyone interested in computing should be examining at this time in history.

FUN, FUN, FUN

I happen to run an on-line Apple users group on one of the computer networks. Recently I expanded the area and to do so, I had to divide the Macintosh interests into two different areas. When the person who runs the IBM area did this, it was pretty easy. He split his area along the lines of hardware and software.

But, for a Mac audience, this did not seem the way to go. Instead, I decided to split the interests along the actual lines of interest expressed in the life of each Mac user.

So I opened one area called "Macintosh Personal Productivity" and another one called "Macintosh Arts and Entertainment" — MACPRO and MACFUN, for short. It was easy to figure out where games should go. Likewise, FKEYs and INITs. Then it came time to place *HyperCard*.

I'm quite a "stackhead" as I'm sure many of the readers of this column are too. I would rather be scripting a new stack than almost any other form of computer recreation. Of course, I don't have the time to do nearly as much of this as I want to.

A *HyperCard* scripter (you do not "program" in *HyperTalk*, you "script" in it) must be both right-brain and left-brain creative. It is not enough to simply use the left-brain to design complex scripts that will interact with each other and the user. Nor is it enough to only set your right-brain to designing beautiful screens and graphics.

HYPERFEAR AND LOATHING

So, I decided to put *HyperCard* into the more "fun" area. Half of our members seemed to like the idea; the other half reacted as if I had purposefully run over their family pet with a tractor trailer. How dare I associate *HyperCard* with fun?

One member felt that by doing this I was giving in to the concept of the Macintosh as a "toy computer." Another person stridently claimed that he used *HyperCard* for serious things and hardly wanted to be around people who were interested in adventure games and art.

At least one Apple employee indicated that Apple Computer Inc. could not look upon such a thing with favor; that it would, in fact, hurt their marketing attempt to ensure that people perceive *HyperCard* as serious software.

Then the people who agreed with me disagreed with the people above. It was shaping up into a regular on-line brouhaha. Finally, I came up with a solution that managed to please most everyone. I took the *HyperCard* interests and put them into their very own "HyperCard Forum." It's too soon to see if the Forum is a success, but at least it stopped people from yelling at me. However, it didn't stop me from thinking.

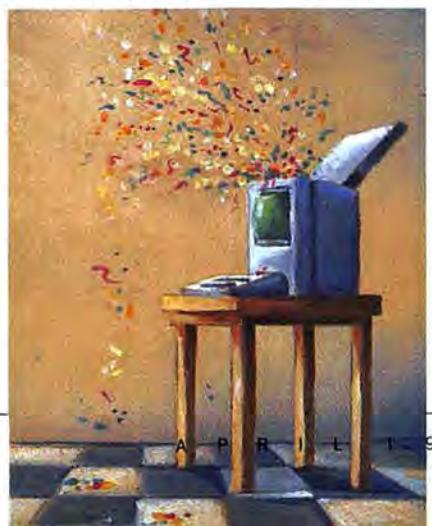
AT LEAST IT'S NOT A WAR TOY

What's wrong with Apple and some of their users who cannot see that, yes, the Macintosh is a toy — a toy in the very best sense of the word? It takes the hardest parts of personal computing and makes them not only accessible, but also opens the possibility of having fun with them.

How many of us have ever been working on a spreadsheet and run just a few more what-if scenarios just because it was fun to watch the numbers change? How many times when you were first learning your Mac did you open and close a few windows and drag them about the screen just because it was fun to do that? When working on a desktop publication do you ever redo a page to get it absolutely perfect just because it makes you feel good to do so?

The best kind of work is work which seems to be play. The work itself can be quite complex, useful, even vital. But if it's fun to the person doing it, the odds are it will be done better than if it were just work that one has to slog through.

I think that the strength of the Macintosh is not just that it's fast, that it has a wide-ranging software base, that it's widely available and is supported by various organizations



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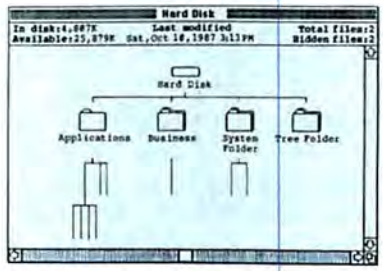
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and publications. I think that the bedrock strength of the Macintosh is that it's more fun to use than any other computer system.

I feel bad for the people who won't admit that *HyperCard* is fun. They're not going to have a good time with things in the coming years. As computers become more deeply involved in society and reachable by more and more people, they are going to have to become more and more fun.

Take a look, for example, at Alan Kay's Vivarium project, which has been discussed in these pages and in other publications many times. One of the goals is to make computers more approachable by disguising them as something else. At least one well-known Vivarium experiment is a computer shaped like a huge, cuddly creature. The user, a child, crawls up into the creature's lap and plays with its keyboarded palms.

This holiday season I was astounded when I went to Toys R' Us and saw the range of talking, sensing toys that are now available. I picked up a Mother Goose toy for my youngest daughter that has all the mouth-moving, eye-blinking expression that you would have found in a multimillion dollar Walt Disney Audioanimatronic figure 10 years ago.

In less than 10 years I predict that there will be toys that will appear absolutely alive. Less than 5 years after that, the same technology will be applied to computers. The Macintosh of the future may well turn out to be almost as much of a "pet" as a tool.

I'm *not* saying that computers will turn into cuddly toys. What I am saying is that they will become more and more fun to use. They will *have* to in order to attract a wider audience. Just as the automobile stopped looking like a horseless carriage and became available in colors other than black, the personal computer is going to have to stop looking like an off-putting, glassy-eyed scientific tool and become a more personalized device.

Meanwhile, I'm going to go fire up *HyperCard* and get back to work on my latest stack. I'm having fun with my Mac. And I'm not ashamed.

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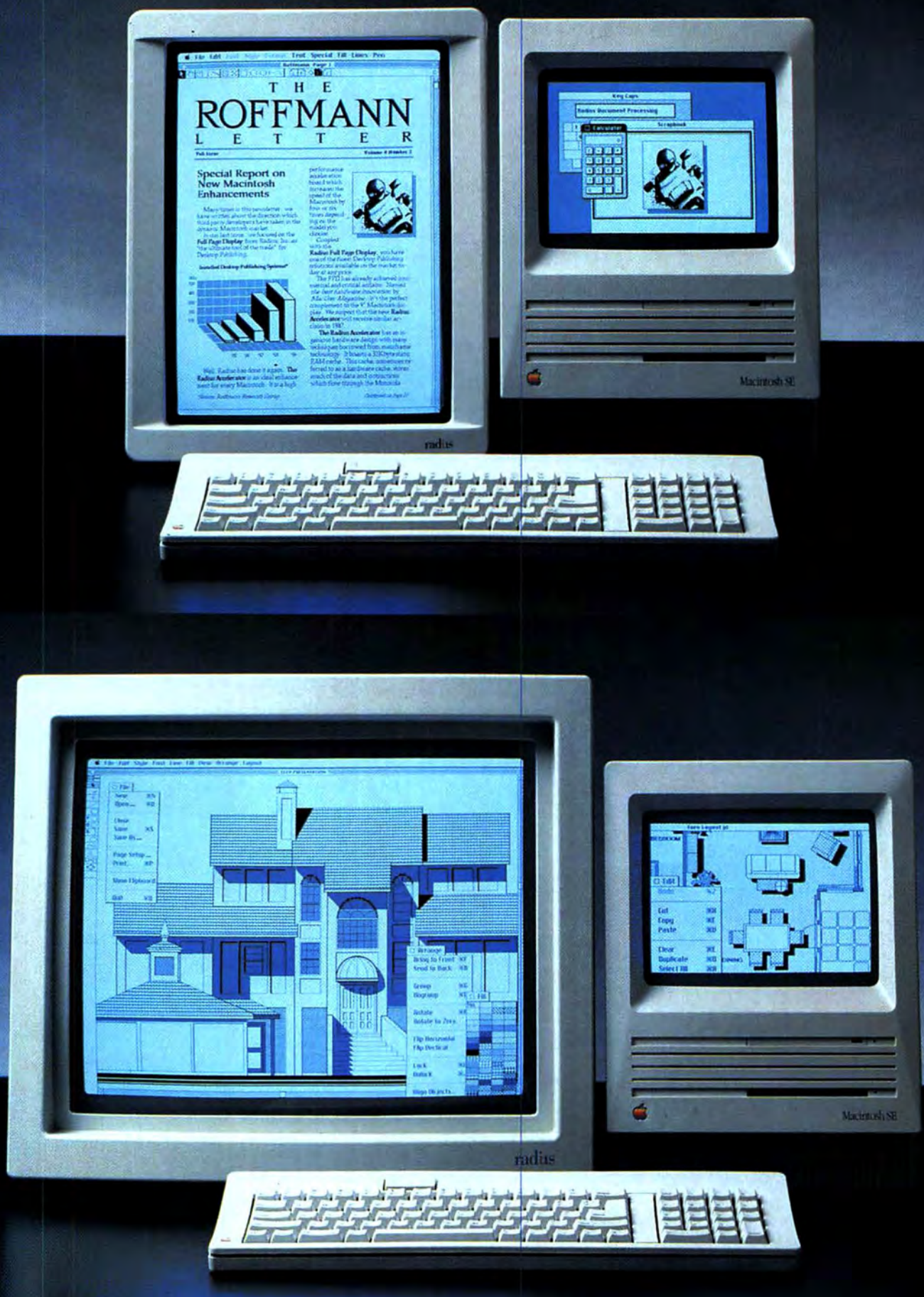
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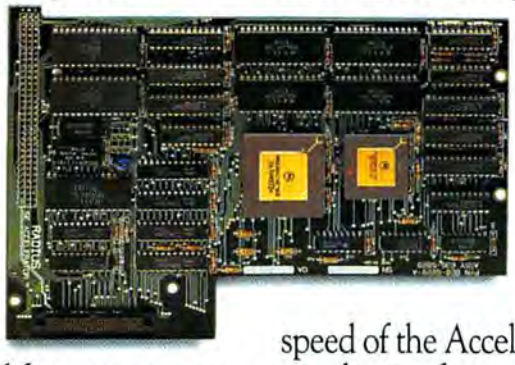

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ROFFMANN
LETTER
Special Report on New Macintosh Enhancements
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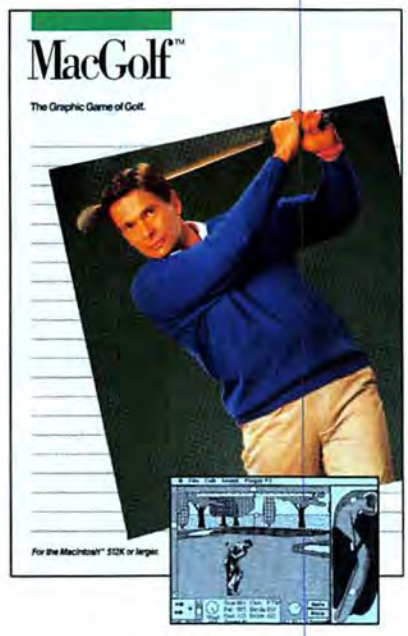


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CUSTER'S LAST MOUSE

I'm missing the page in my December '87 *MacUser* in which the editor prints a rebuttal to Linda Custer's review of *HyperCard.* How could she give the program that is being billed as the "Future in Macintosh Software" only 4 mice?

MIKE PINKERTON
RESTON, VA

And it's in good company. MacPaint, *this year's recipient of the Eddy for Most Significant Mac Product (1984-1987) is also only a four-mouser. The current version of* HyperCard *is also imperfect. We'll definitely reconsider the rating when Bill (and friends) fix it.* — JZ

GOODENOUGH IS ENOUGH

It is flattering to have had it supposed that the *HyperCard* stack, *Inigo Gets Out,* (mentioned in Linda Custer's December '87 article, "Stacking the Deck") was created by a child. But it was not. Amanda Goodenough, the author, is the wife, not the daughter of Bob Goodenough.

AMANDA AND BOB GOODENOUGH
SANTA CRUZ, CA

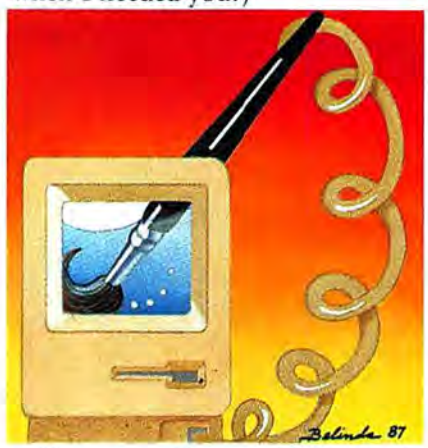
So that *explains those nasty rumors.* — JZ

COMIC RELIEF

I was enchanted with Carlos Domingo Martinez' account of *Comic Strip Factory* (December '87), and the dazzling results he produced with it. I find it especially charming that Fred Nerd can sprout a right hand on his left arm at will (in Panels 4, 8 and 10) in this highly adaptable environment. Delightful! I wouldn't have it changed for anything.

I yearned to become a comic strip artist from the time I was 10. When I got my degree in art, I wrote to Disney Studios asking for a job, and was blandly told that they didn't hire women. Of course, that was 49 years ago. It may still be true, but now they wouldn't dare put it in writing.

Instead of becoming a comic artist, I have illustrated seven picture books for children (which I wrote) and now I spend my time creating word puzzles for a lively market. I wonder if I could find time for *Comic Strip Factory*???? (Where were you when I needed you?)



How many 71-year-old women do you know that have owned and used five computers so far (all with striped Apples on them), the current one being a Mac II? Add me to the list. I've got modem hardware and *Red Ryder* 9, but haven't figured out how to get it going. I wish I could use it to talk to you, but its documentation is for hackers, not for little old ladies.

NAIDA DICKSON
GARDENA, CA

Try Red Ryder *10 (the commercial release of the product). The documentation should be easier to deal with. If this doesn't work, you might want to try other communications packages, such as* MicroPhone *or* SmartCom. *We'd like to talk to you, too.* — LK

THE SPIRIT OF 76

I got my 128 in April of 1984. Since then I have learned *MacWrite, MacPaint, MacDraw, SuperPaint, Mail Manager, MultiPlan* and now I'm on *PageMaker* (a toughy). But your magazine is getting too technical for such as me. What I wish is that you would think about us occasional users (2 hours a day, max) who can't absorb all the new technical talk we read in your magazine. Really, it reads like you are writing to programmers only! P.S. I'll be 76 next June.

FRED KENTNER
SCOTTSVILLE, NY

Fred, meet Naida; Naida, Fred. Maybe you two kids should form a study group. — JZ

CUT TO THE QUICK

Having had absolutely no experience with computers, I purchased an SE with internal hard drive last July. It was the morning of the day I had a vasectomy scheduled and although I have a wonderful wife, a little boy and girl, and cat and dog, I wanted to assure that my family was complete before I went under the blade. Well, the SE has seen to that. Now I'm beginning to wonder if I will ever see my wonderful wife, little boy and girl, and cat and dog again.

After 6 months of tutoring myself on the Mac, I am proud to say that I can now run all kinds of software, perform incredible feats and understand most of what I read in your magazine. One point of contention, however. Well over 90 percent of the expensive calls I have made for technical support (most of the time being on hold) were solved when I was finally informed that "Yeah, that was a mistake in the manual." You can be sure I cross those companies off my list of future purchases.

One oasis in this desert of support, however, has been Letraset. When I received the upgrade to *Ready, Set, Go!* 4.0, I encountered several problems which were mostly of my own making. But what a pleasure to call an 800 number, get through immediately each time I called, have my problem solved and be back to work in minutes. They deserve some recognition for this level of support!

STEVE CRAWFORD
SHELTON, WA

They just got it! — JZ

IF YOU'RE READING THIS, IT'S TOO LATE

Do you recall that dreamy day when someone first opened your eyes to an Apple computer, known

BELINDA MORRISSEY



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affectionately as the "Mac"? The smile you beamed back at that happy little face glinting at you on the screen?

Yes, Macs are both indispensable and innocuous. (Of course, Sigmund Freud thought cocaine was harmless, too.) Friendly little nonthreatening, easy-to-learn, responsive machines! But then something strange happens. Bonding takes place. Away from your office at night, your thoughts turn continually to your lonely little Mac. You are unable to concentrate on domestic tasks, or anything else for that matter, without having your thoughts interrupted by an image of beckoning new software programs. You soon discover that you also need a Mac at home.

This inexplicable attachment borders on the neurotic. Recently a friend anxiously asked if I would babysit his Mac while he was on Christmas vacation. I have overheard a person whose signature is followed by a Ph.D. exclaim: "I love my Mac, my Mac loves me!" As if this conglomeration of chips and bits and wires were capable of expressing emotion.

You may have noticed physiological changes to your own CPU since becoming a MacAddict. Everything, including your rate of oxygen exchange, becomes faster. Time was when I could amuse myself with the "Life's Like That" section from the *Reader's Digest* while waiting in a grocery line-up. On a good day, I would even allow shoppers with fewer items to proceed ahead of me to the cashier. Today you will recognize me as the person tapping their foot, snapping fingers together while looking nervously from side to side. Reminds me of a line I read about children preferring Atari's to teachers because teachers talk too slow.

There was a time I took pride in my penwomanship. But keystrokes have made the penstroke obsolete. My handwriting now looks like that of a medical school candidate — interpretable only by a pharmacist.

Future MacAddicts, heed my warning. If you haven't already succumbed to the temptation, think, before leaving the land of low-tech innocence, of those immortal words of Adam when he said to Eve: "Are you sure you want to byte into that Apple?"

KAREN WILSON
VICTORIA, BRITISH COLUMBIA

JUST SAY NO

I have a friend, actually he's now married to my sister, anyway he has me in a bit of a fix. The time was that we both had Apple IIs and he would pass on to me what seemed like hundreds of pirated program disks packed with "you-name-it" programs. There were public domain programs, commercial programs with no documentation, junky programs that would bomb more often than not. I can't think of any programs he pirated and gave to me that I ever more than just looked at. Needless to say, I ended up with a lot of disks for re-initialization.

I am now on my second Mac, and have just upgraded my software for my SE. My friend's new position affords him the opportunity to purchase his first Mac. Now the problem: As he told me the good news (he's ordered an SE), he also, with a big grin, told me he wants copies of my software. Now, I'm no do-gooder but this irked me. I worked hard to buy my software. I guess the end result of all this will be that he will end up with some copies, unless something extraordinary happens. I'd rather not but I don't know how to get out of it.

UNSIGNED
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Dear Rock: There's no honor among thieves. What's so extraordinary about saying no? — JZ

IN THE CARDS

Please realize what you have done in the artwork of your subscription card. Yesterday the card fell out of my latest copy of *MacUser,* and there on the card, I saw plain as day, the silhouette of a 5¼ inch diskette. Heaven forbid — it's an IBM diskette on a *MacUser* subscription card!

P .C. ROGERS
PATRICK AFB, FL

"P.C."?! Talk about the pot calling



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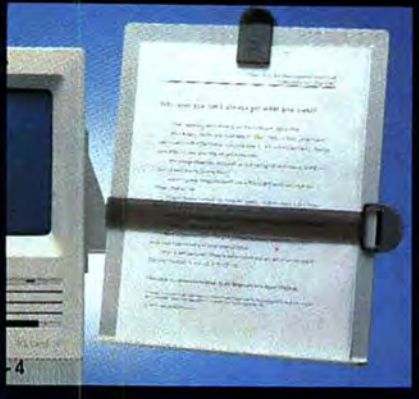


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the kettle black — I'd do something about that name before you start throwing stones. Be fair; if you squint, the art on the postcard insert in question has some of the design elements of the bottom side of a Mac floppy (PC floppies don't have rounded corners). — JZ

FINDER'S KEEPERS

I've used programs other than the *Finder* as the "startup program" and tossed the *Finder*, only to put it back. I have used Apple's *MiniFinder*, and tossed it. I have tried *Oasis, WayStation, HFS Locator, DiskTop*, various launcher DAs and FKEYs, and now the stackware minifinders, and tossed them all. The *Finder* is the essence of the Macintosh interface, and has itself always been the best available replacement for the *Finder*. I really don't understand why there is such interest in avoiding the *Finder*. The new *MultiFinder/Finder* combination beats everything I've ever seen. (I never liked *Switcher*, either, though occasionally useful.) If there is good judgment in Macdom, all those *Finder* replacements will now dry up and blow away!

If there is good judgment in Macdom, all those Finder replacements will now dry up and blow away!

DOUGLAS G. MILES
ELLENSBURG, WA

UNWARRANTED WARRANTIES

There is no such thing as a free lunch," especially in business. While I agree with most of Robert Wiggins' January '88 column, I take exception with his implication that an extended warranty should accompany each new piece of hardware and software. When I purchased my 128K Mac four years ago, I, too, was

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skeptical about that 90-day warranty. But during the intervening years, my Mac has been in the shop only once, and that was to have it upgraded to a Mac Plus. I shudder to think what that Mac would have cost me had it come with a 4-year warranty.

Manufacturers are not going to assume all the risk associated with an extended warranty unless they are compensated for it in some way, usually by a higher price tag. On the other hand if the quality of the merchandise is such that it *requires* a long warranty, the marketplace will soon brand it as being inferior and it will not succeed, warranty or no warranty.

GIUSEPPE DONADIO
MONTEREY, CA

On the third hand, if the product is well-designed and reliable to begin with, an extended warranty shouldn't involve much risk for the manufacturer. — LK

MORE FAN MAIL

Since the Mac SE is the first computer I've bought, I can't compare it to the earlier Macs. However, my 1-month old daughter enjoys the *gentle* whir of the cooling fan on our family's SE. But she also likes the sound of our vacuum cleaner, too. It must be a matter of perspective.

STEPHEN R. CALDWELL
WURTSMITH AFB, MI

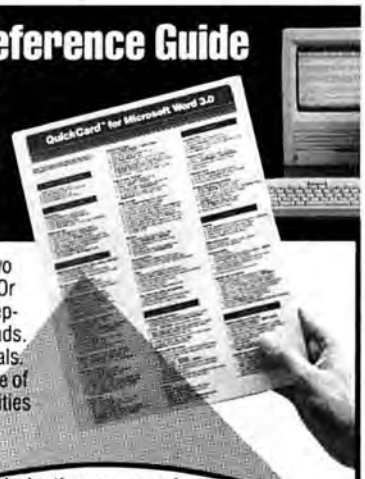
SLOWING REFLEXES

Steve Bobker's column "Fixing What Ain't Broke" (January '88) had special meaning for me. I "upgraded" to *Reflex Plus* from *Reflex* about a month ago. I'm afraid *Relex Plus* is really a "degrade." The first thing I noticed was that the program ran slower than the original, a most unpleasant surprise. But this was only the first of many changes for the worse. Borland has changed many command key combinations from mnemonic letters to nonsense letters. For example, COMMAND-N for NEXT RECORD and COMMAND-P for PREVIOUS RECORD in Reflex are changed to COMMAND-[and COMMAND-] in *Reflex Plus*.

There are numerous other changes to the program which make it more

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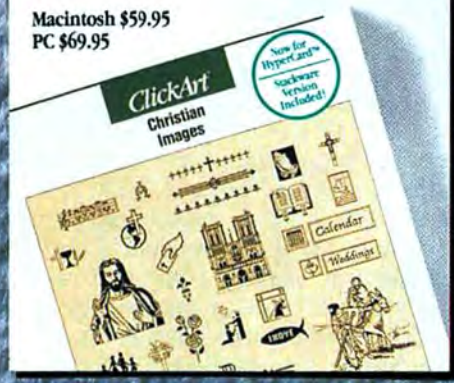
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difficult to use, but the bottom line is that I found this "improved" program so unwieldy that I went back to using the original version. Perhaps Borland will soon introduce "*Reflex Minus*" which will correct the misdirected changes.

STEVEN LANGERMAN
MAPLEWOOD, NJ

APPLAUSE FOR CLAPP

Re: Doug Clapp's "It's a HyperKick!" in the November '87 issue. I want you to remember that guy's name at his next salary-raising occasion: His are the often-thought, but seldom-if-ever voiced perspectives! A gold mine, no less. I think he deserves more than just his share of praise for his frank and straightforward words. I agree 100 percent with his conclusions and say "nuts" to all the developers now kvetching that Apple did this or that...well, why didn't they do it instead? HyperPower to the People!

IAN FELDMAN
STOCKHOLM, SWEDEN

THREE MEN AND A MAYBE

Come clean, guys. "John C. Dvorak" is really just Neil Shapiro, Doug Clapp and Dan Cochran after they've had a few beers, right?

ROBERT WINTLER
SANTA MONICA, CA

If you consider the problems of getting three freelancers on two coasts and a middle together in time to meet deadlines, you'll see that this can't be. However, we're willing to entertain other theories. — LK

VELCROHOLICS ANONYMOUS

One cannot help but applaud Douglas Adams' insights into *HyperCard* and general Macaphilia (December '87). All who owe the original creators of the Mac a sense of wonder reminiscent of childhood will soon acknowledge that *HyperCard* realizes a new threshold of communications. Mr. Adams does. His sense of perspective and musical tastes are appreciated as well. While I do not share Mr. Adams' lofty opinion of Velcro, I would not presume to guess what uses he may have for it.

Re: Doug Clapp's column on the

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cost per byte of programs. What is he planning for an encore, a look at the relative price per page of software manuals? Or perhaps a projected value per square inch of paintings in the Metropolitan Museum?

GONZO FONT
NEW YORK, NY

We're not sure we believe that name. Let's see, how much would Van Gogh's Sunflowers *come to per seed?* — JZ

LESS FILLING

With the January '88 issue I have at last found something to appreciate about "The Devil's Advocate" by John C. Dvorak — with the increased size of your magazine (286 pages) he takes up a smaller percentage of the total.

MARK J. HEGENER
WAUCONDA, WA

I hadn't thought of it that way. I wonder how he'd feel about writing two pages? One way or the other, as long as John remains the columnist you all love to hate, he will have a place of honor in MacUser. *We need him to help fill out the Letters column.* — LK

A CASE OF THE VAPORS

I applaud your decision, announced in editor Steven Bobker's December '87 column, to review only finished, released software (and hardware?) from now on. But if reviews of pre-release products may mislead the reader, doesn't the same hold true for other kinds of articles? Just a few pages from the announcement of your policy, I came across your "Miss ng Piec s" table detailing the features of, among other products, *FullWrite Professional* and *WordPerfect*. As of this writing, neither of those long-delayed programs has yet been released, and they certainly weren't complete when the table was prepared. Elsewhere in the same issue I find several other so-far non-existent products described, implicitly or explicitly, as "now shipping."

You note, graciously, that *Macazine* already had a policy of reviewing only finished goods. You might have added that *MacWEEK*, too, has firmly maintained the same approach since its very first issue last May.

HENRY NORR
SENIOR EDITOR (REVIEWS), MACWEEK

Your point is well taken. We've recently begun to delete pre-release products from those charts and will keep an eye out for the problem in other areas, too. — LK

DOWNWARDLY MOBILE

I've heard a lot about Mac-PC communication and file transfer software and cards. I've even heard about a card that lets the Mac II emulate an IBM PC. Why isn't there a card that lets the Mac II emulate a Mac Plus? This would allow people to use the old applications that currently don't work on the Mac II. I know one person who has a Mac II, but keeps his old 512 right beside it to run some of the old utilities. I pic-

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ture a card that would let the user toggle between II, Plus and 512, perhaps even HFS and MFS. This may seem to be an intentional downgrade of a fine computer, but isn't emulating a PC the ultimate downgrade?

ADAM E. EK
ORONO, ME

NAME THAT MAC

What's in a name? The future of our Macs! When the Macintosh was introduced it was certainly unique, if for nothing else, for its name — plain English outstanding in a crowd of numbers and letters. Its three-syllabled moniker (and that of its progenitor, Lisa) had always been in stark contrast to those machines that would be the tools of choice for corporate America: PC, XT, AT, 286, 386, T1000, Z-181, 6300, etc. Even in its first serious reincarnation, it still emerged without numeric or alphabetic appendages as the Macintosh Plus.

But now we have the clearest evidence yet that the Mac has forsaken its roots for the lure of the boardroom — the Macintosh SE and II. How long before the digits displace the name entirely? How long before the small-time users are forgotten entirely? Only time — and the name — will tell?

DENNIS B. APPLETON
LYNBROOK, NY

CULT HOLD-OUT

I am troubled by the penchant of several of your editors to imply, in various ways, that there is some sort of a class difference between Mac users and "other" computer users. Back in 1984 I bought a computer, not membership in a cult.

I was particularly disconcerted with a plug (in the November '87 issue) for a software product (by Louise Kohl, whose work I often enjoy) which implied that there was something immoral about investing money with people who produce items for the military forces of the United States. Her political, moral or intellectual preferences have no place in *MacUser*. Why should I pay for this?

MARK BURPO
SAN DIEGO, CA

First things first. Did you forget to send in your cult registration card when you unpacked your Mac? I guess you haven't been receiving the special *newsletter and mind-altering software. Second, we like to think of them as articles or news items, not plugs. (Of course, we also like to think that we really* might *have already won $10 million, too.) Third, the article in question (about* EthInves, *The Almanac of Socially Responsible Investing) noted that this product provided information about what you're supporting by investing in various companies; how that information influences your consumer choices is up to you. And, finally, if you were somehow able to excise all of the editors' political, moral and intellectual preferences from a magazine, you'd be left with little more than paper pulp. We agree on one thing, though: We often enjoy Louise's work, too.* — JZ

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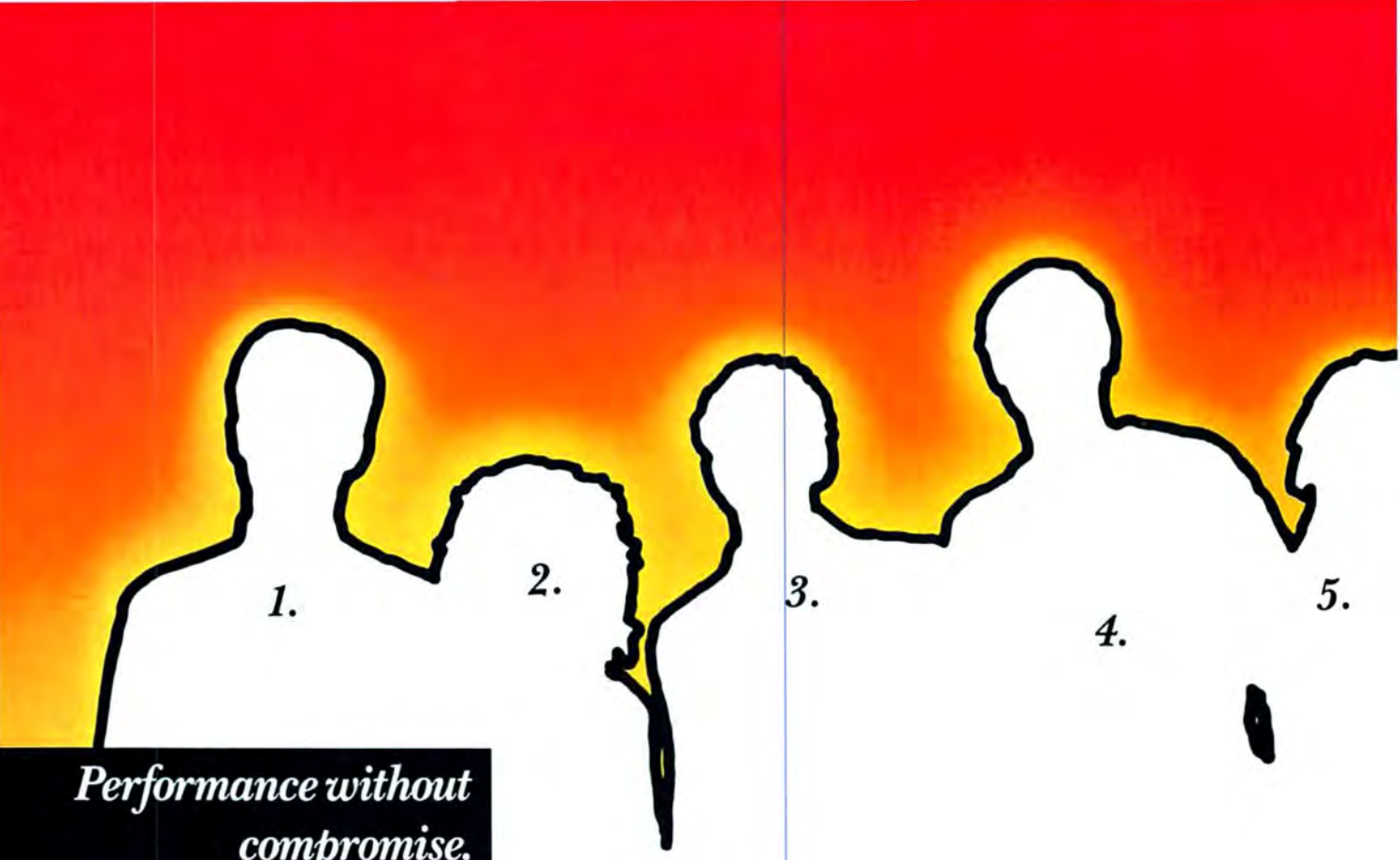
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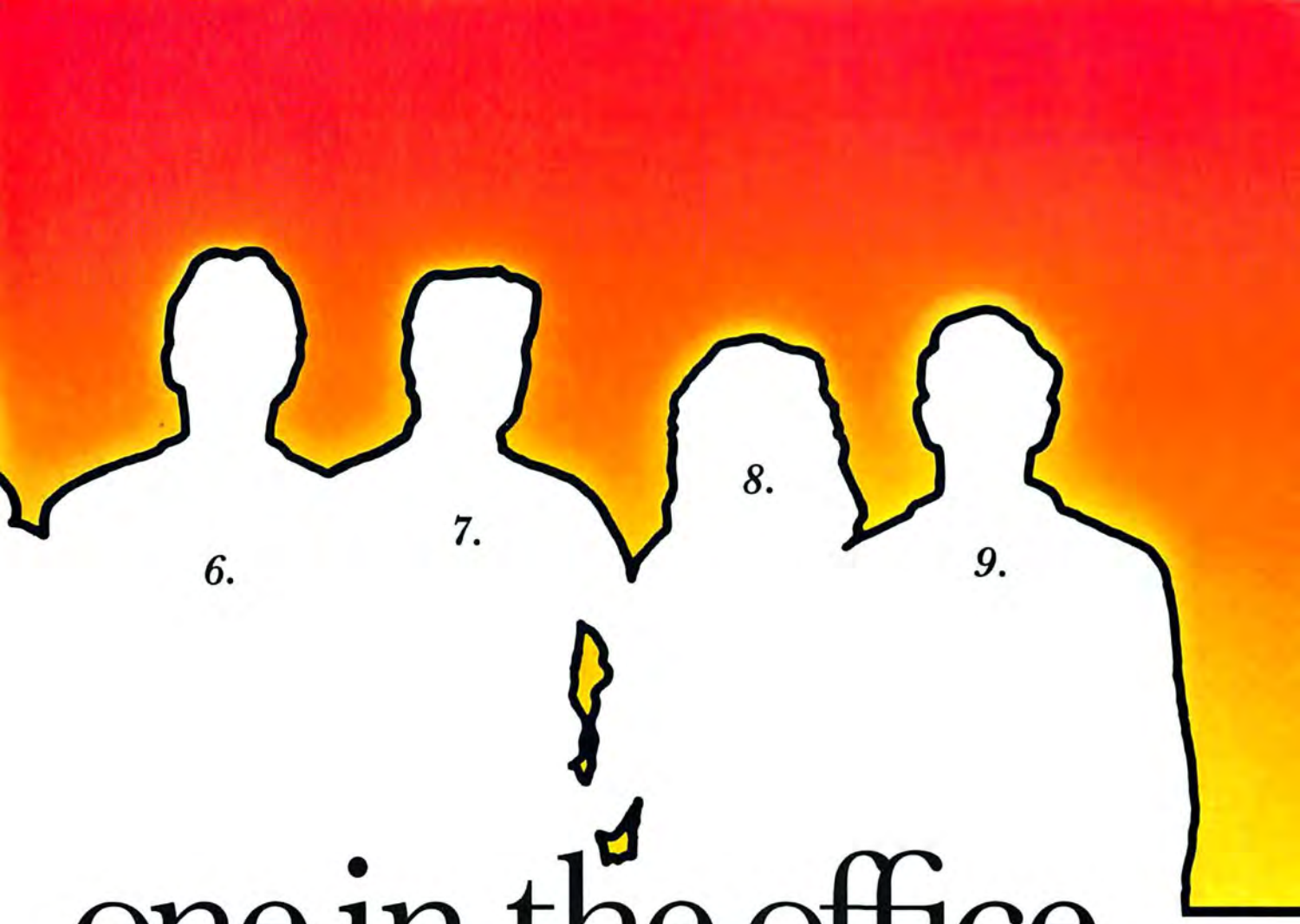
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EDITED BY LOUISE KOHL



Apple's NAMM Debut

The National Association of Music Merchants (NAMM) holds its huge semiannual Winter Show in Anaheim. For three days, attendees wander amid the many and varied sounds of music through hundreds of booths stuffed with musical instruments, gossip, accessories and computer music software.

New exhibitors traditionally herald their arrival with a cool new tote. Mixed among the orange Roland bags and multi-hued Korg sacks was a new, white arrival. Captioned "Now Hear This," it sported a Mac Plus and a Yamaha synthesizer.

The Apple MIDI Interface has arrived. This $99 box (akin to a tiny, dumb modem) is sold through VARs and dealers only.

Apple's booth hosted Activision, Digidesign, Southworth Music, Resonate, Integrated Media Systems, Graphic Notes and Passport Designs. Digidesign and Southworth showed NuBus Digital Signal Processing (DSP) cards — neither was shipping yet. Integrated Media Systems' Dyaxis hard-disk digital recorder/editor portends digital mastering under $10,000. Passport was showing the latest version of its *Master Tracks Pro* 2.0 sequencer. (A less expensive, scaled-down version called *Master Tracks Jr.* should also be shipping by the time you read this.) And Resonate has updated its fine ear-training program, *Listen* 2.0.

Folks crowded Graphic Notes' corner to see a new trio of products. *Fortissimo* is a desktop scoring application that uses a unique ADB input device. This "Presto" keypad lets you enter individual pitch values simultaneously with rhythm values entered on the Mac keyboard. Completing the trio is Graphic Notes' *Repertoire* font for publication-quality laser printer and typesetter output.

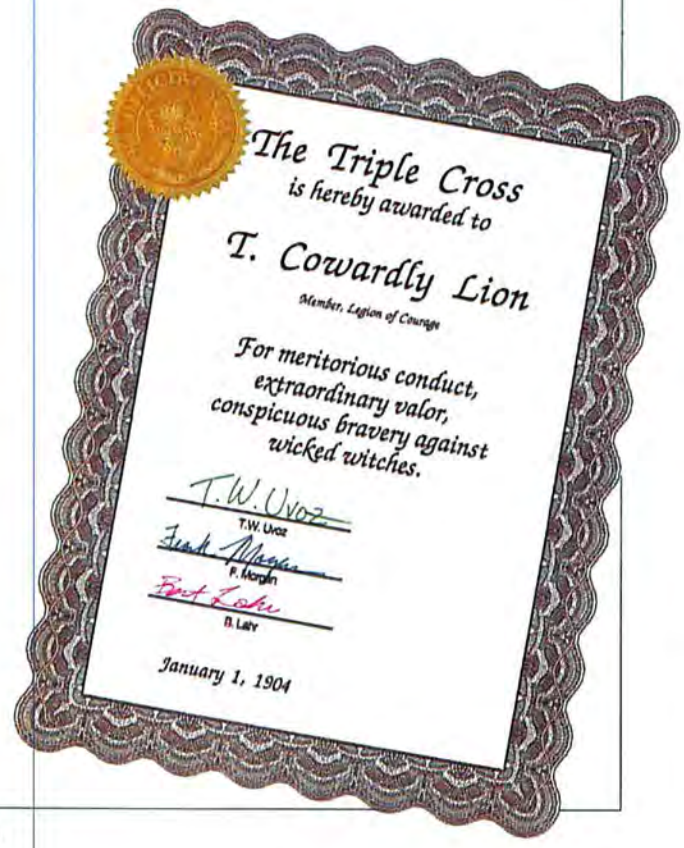
Software vendors welcomed Apple's born-again interest in the music marketplace. Veteran NAMM attendees were pleased, but some were afraid that Apple will colonize the market, dictating to developers. Others felt it was a token gesture (will Apple be in Atlanta in June?). One attendee noted the preponderance of engineers in the booth crew and wondered aloud whether Apple really knows the creative side of music.

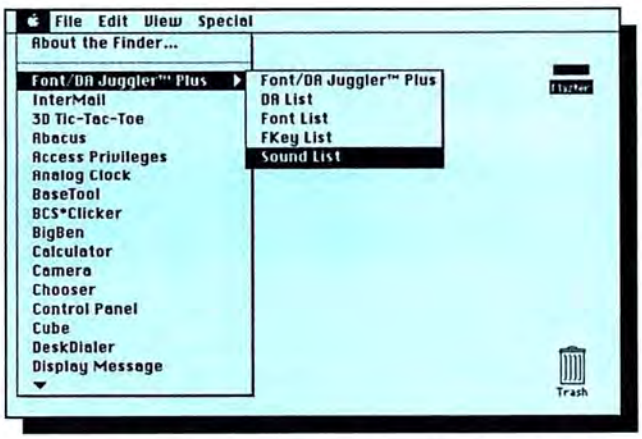
Why Apple's sudden interest? (The interface itself is a trivial engineering effort.) Well, some 350,000 MIDI synthesizers are sold annually, and computers are among the hottest MIDI "accessories." Atari is selling its economical ST and new Mega computers through major music retailers. Because of this, more and more Mac programs are ported to the Atari (which was designed with MIDI onboard). Many musicians are finally contemplating upgrading from their Commodore 64s; who will sell them their next computer? Apple won't cede a hot market to an archrival. — *Craig O'Donnell*

The Envelope, Please

Everybody needs a pat on the back now and then, and it's even nicer when it's documented. *Award Maker Plus* from Baudville lets your Mac create high-quality certificates in recognition of meritorious conduct and deserving acts.

You can select from a wide variety of certificate styles, graphics, fonts and borders to create a personalized award. The official gold seals included (appropriately embossed "The Official Seal") add a finishing touch. (Parchment paper is also available from Baudville.) *Award Maker Plus* keeps up to 100 names on file, if you've got a lot of people to congratulate. Contact Baudville at 5380 52nd Street SE, Grand Rapids, MI 49508; (616) 698-0888. — *JZ*





Juggling It All

Overcoming the limits on the number of fonts, DAs and FKEYs you can have on your Mac seems to be an idea whose time has come. First we saw *Suitcase,* which lets you pack them in; now there's *Font/DA Juggler Plus* from Alsoft.

Font/DA Juggler Plus has some interesting and useful bells and whistles in addition to its basic function. A particular favorite is having font names printed in their own typeface. The program also gives you access to the Mac II SND sounds, in case you get tired of the utilitarian beep. Three utilities come with the program: two which let you rename and renumber DAs, FKEYs and sounds, and one which automatically takes care of conflicting font numbers.

We'll be reviewing *Font/DA Juggler Plus* and *Suitcase* head to head in an upcoming issue. If you can't wait for the results and want to see for yourself, get in touch with Alsoft at PO Box 927, Spring, TX 77383-0927; (713) 353-4090. — *LK*

Need AHUG?

Don't panic. We haven't started plugging Leo Buscaglia. We just want to let you know that Apple employees have formed their own *HyperCard* user group, AHUG, and it's open to the public. AHUG participants include members of the *HyperCard* development team, so you can send your suggestions and questions straight to the source. To find out more about AHUG, and/or to get a copy of their newsletter, *Windoid,* send a self-addressed, stamped envelope to their president, David Leffler at AHUG, c/o David Leffler, Apple Computer, 20525 Mariani Ave., M/S 27 AQ, Cupertino, CA 95014. *Windoid* is also posted on *AppleLink,* as well as a number of other information services, and David Leffler can be contacted directly via *AppleLink* at Leffler1 or HYPERBUG. — *RI*

Reading to the Left

Desktop publishing in Hebrew is now not only practical, but fairly easy. Two new products, *Rav-K'tav* and *MacKtav,* are a Hebrew word processor and version of *Ready, Set, Go!* 3, respectively. Both allow you to freely mix Hebrew in a right-to-left direction and left-to-right English. Although the menu commands remain in English, a special version of the *System* lets you name files and folders in Hebrew.

Rav-K'tav, which roughly translates to "MultiWriter," comes with clear keyboard stickers for the 26 Hebrew characters that won't block out the English alphabet keys. Both English and Hebrew fonts can be downloaded to either the ImageWriter or a PostScript printer. *Rav-K'tav* is a revised version of *Achbar,* an earlier Hebrew word processor. The program now has more advanced word processing features like multiple document windows and automatic Save.

MacKtav is based on *Ready, Set, Go!* 3 and is licensed from Letraset. An additional manual explains the Hebrew functions. A Hebrew version of *RSG!* 4 was being worked on as of press time.

Both programs are also available in an English/Arabic version. *Rav-K'tav* costs $350 and *MacKtav* is priced at $595. The price of font disks ranges from $25 to $125. All are available from Davka, 845 N. Michigan Avenue, Suite 843, Chicago, IL 60611; (312) 944-4070. — *BT*

Sorry, Wrong Number...

If you've tried to call Sigma Designs at the number given in the January '88 New on the Menu section, it's probably too late to warn you about the loud and piercing beep that goes off when you connect. The published number, (415) 770-0110, gets you a fax machine. For a more human response call (415) 770-0100. — *BT*



Up and At 'Em

Here's a handy little item that recently appeared in the *MacUser* offices, McWedge from Tap Fabrication, 3011 Alvarado, San Leandro, CA 94557. (Outside California, you can call (800) 821-1984.) It holds your Macintosh 512, Plus or SE up a bit and at an angle for your viewing pleasure. While not as versatile as the MacTilt stand (McWedge is entirely stationary), it does the basic job. And you can't beat the $19.95 price. — *LK*

As If We Didn't Have Enough to Worry About

So, you think you're not paranoid, eh? Well, try this one: You flip the switch on your Mac, and ZAP! A static charge leaps from your finger and melts the chip. It can happen. Still think you aren't paranoid?

Before you start replacing your flooring with glass tiles or rubber sheeting, you might want to take a look at AsCat, from TECH-SA-PORT. AsCat is an anti-static carpet treatment that you spray on your floors, and — provided you never wear any sweaters over synthetic fabrics — you can keep that static bugaboo at bay. Of course, since AsCat is non-toxic, non-flammable, odorless and comes in one and five liter containers, you could play it safe and spray your sweaters too.

For your peace of mind, contact TECH-SA-PORT at PO Box 5295, Pittsburgh, PA 15206-5295; (412) 661-2629. Now all you have to worry about is slipping in the bathtub. — *RI*

UPDATES

Programs, like wine, often improve with age. To get the most out of your programs, you should be using the most recent versions. Here's a list of the current version numbers (as of press time) of many popular programs. The version number of a program can usually be found by running the program and checking the ABOUT... item at the top of the Apple menu.

Apple *System* software is special. Generally, and unless you have a 128K Mac, you should be running the latest System software. (128K owners should continue to use *System* 2.0 and *Finder* 4.1.) The latest Apple *System* software is available free from most user groups, national on-line services and local BBSs. The deluxe version (four disks, boxed and well-documented) can be purchased through Apple dealers for $49.95, not a bad deal considering what's included: *Finder* 6.0, *System* 4.2 or 4.3 and the long-awaited *MultiFinder* 1.0. As information on *MultiFinder* compatibility becomes available, we'll keep you informed.

All programs listed here are HFS compatible. The meanings of the codes in the right column are as follows: CP or NCP, copy protected or not; //, programs we have found to be Mac II compatible (not yet a comprehensive list); and S, shareware (try before you buy software). Changes and new listings are shown in **bold.** Compatibility is sometimes in the mind of the beholder. Programs listed as Mac II compatible may not perform 100 percent of the functions they offer on other Macs, nor do they necessarily take full advantage of the Mac II.

A.A.I.S. Prolog	M1.15	NCP
Acta	2.0	NCP,//
AMS General Ledger	2.08	NCP
AppleShare	1.1	NCP
Aztec C	3.4b	NCP,//
Back to Basics	1.03	NCP
Balance of Power	1.03	CP
Bulk Mailer	3.0	NCP,//
Business Filevision	1.1	NCP
CalendarMaker	3.0	NCP,//
Chart	1.0	CP
Chooser	3.2	NCP
ClickArt Effects	1.01	NCP,//
Clipper	1.01	NCP
ColorChart	1.3	NCP
Colorizer	1.1	NCP,//
ColorMate	2.1	NCP
ColorPrint	2.03	NCP
Comic Strip Factory	1.6	NCP,//
Comic Works	1.0	NCP,//
ConcertWare+	4.0	NCP,//
ConcertWare+MIDI	4.0	NCP,//
Copy II Mac	7.1	NCP
Copy II HD	7.1	NCP
Cricket Draw	1.1	NCP,//
Cricket Graph	1.2	NCP
Deluxe Music Construction Set	2.0	CP
DesignScope	1.14	NCP,//
Disk Express	1.10	NCP
Disk First Aid	1.0.1	NCP
DiskFit	1.4	NCP,//
DiskInfo	1.45	NCP,S
Disk Ranger	3.1	NCP
DiskTop	3.0.2	NCP,//
Dollars & Sense	4.0	NCP,//
Double Helix II	r40	NCP,//
Easy3D	1.01	NCP
Edit	2.1	NCP
Excel	1.06	NCP,//
ExperCommon Lisp	2.2	NCP
ExperLisp	1.5	NCP,//
ExperLogo	1.1	NCP
EZ Draft	2.0	NCP,//
FastBack	1.02	NCP,//
File	1.05	NCP
Filemaker Plus	2.1	NCP,//
Finder (MFS-128K)	4.1	NCP
Finder (HFS)	6.0	NCP
FlashBack	1.6	NCP
Flight Simulator	1.0	CP
Fokker Triplane	1.0	CP
FONTastic Plus	1.4	NCP, //
Font/DA Mover	3.6	NCP
Fontographer	2.3	CP
Forecast	2.0	NCP,//
Frame Mac	1.1	NCP,//
FreeTerm	2.0	NCP,//
FullPaint	1.0	NCP
Gato	1.42	CP
Glue	1.04	NCP
GraphicWorks	1.13	NCP
Hard Disk 20	1.1	NCP
Hard Disk Utility	2.0	NCP
HD Backup	1.0	NCP,//
HD SC Setup	1.5	NCP,//
HFS Backup	2.01	NCP
HFS Locator Plus	2.0	NCP
Illustrator	1.0	CP/NCP,//
ImageWriter	2.6	NCP
ImageWriter, AppleTalk	2.6	NCP
InBox	2.0	NCP
Insight GL	2.0	NCP,//
inTalk	3.0	CP
Jam Session	1.1	CP,//
Jazz	1A	CP
JustText	1.1	NCP
Laser Author	1.3	NCP,//
Laser Prep	5.1	NCP
LaserShare	1.0	NCP
LaserSpeed	1.5	NCP,//
LaserStatus	2.0	NCP
LaserWriter	5.1	NCP
Layout	1.3	NCP,S
Legal Billing	1.72	NCP,//
Legal Billing II	2.39	NCP,//
Lightspeed C	2.01	NCP
Lightspeed Pascal	1.0	NCP
Listen 2.0	2.1	CP,//
Lode Runner	1.0	CP
Mac3D	2.1	NCP,//
MacASM	1.2	NCP
MacBillboard	4.01	NCP,S
Mac C	5.0	NCP,//
MacCalc	1.2	NCP
Mac Disk Catalog II	2.1.1	NCP
MacDraw II	1.0	NCP,//
MacDraft	1.2b	NCP
MacFlow	1.02	NCP
MacFortran (all)	2.3	NCP,//
MacGolf	2.0	CP
MacInTalk	1.1	NCP
MacLabeler	2.2	CP
MacMoney	2.02	NCP
MacMovies	1.02	NCP
MacNosy V2	2.8	NCP
MacPaint	2.0	NCP,//
MacPalette	1.0	CP
MacPascal	2.1	CP
MacProject II	1.0	NCP,//
MacProof	3.0	NCP
MacSafe	1.08	NCP,//
MacServe	2.3	CP,//
MacSpec	1.3	CP
MacSpin	1.1	CP
MacSpool	2.1	NCP
MacTerminal	2.2	NCP
MacTools (MFS/HFS)	7.1	NCP
MacWrite	5.0	NCP,//
Mac Zap	5.0	NCP,//
MailManager	1.0	CP
MapMaker	2.0	NCP
MDS	2.0	NCP
Measure Test	12.7	CP,S,//
MenuFonts 2	2.0	NCP,//
Megamax C	3.0	NCP
MicroPhone	1.1	NCP,//
Micro Planner Plus	5.8b	NCP
MindWrite	1.1	NCP,//
miniWriter	1.4	NCP,S
MockPackage+	4.3.4	NCP,S
MORE	1.1C	NCP,//
MPW	2.0b	NCP
MS BASIC	3.0	NCP
MS BASIC Compiler	3.0	NCP
MS Fortran	2.2	NCP
MS Works	1.1	NCP
Multiplan	1.1	NCP,//
MusicWorks	1.1	CP
myDiskLabeler	2.11	NCP
Neon	2.0	NCP
Omnis III Plus	3.26	CP,//
OverVUE	2.1	NCP,//
PackIt III	1.3	NCP,S
PageMaker	2.0a	NCP
Parameter Manager	1.092	NCP
Performer	2.2	CP
PictureBase	1.2	NCP
Plains and Simple	4.1	NCP,//
PowerStation	1.1	NCP
Professional Composer	2.1	CP
Profit Stalker II	1.3	NCP
Project Billing	3.0	NCP,//
QUED/M	2.04	NCP
QuicKeys	1.1	NCP,//
Rags to Riches	3.0	CP,//
Ragtime	1.1	CP,//
Ready, Set, Go!	4.0	NCP,//
Record Holder	2.1	NCP
REdit	1.2	NCP
Red Ryder	10.3	NCP
Reflex Plus	1.0	NCP
ResEdit	1.1b7	NCP,//
Sargon III	1.0	CP
Scoop	1.01	NCP,//
SideKick	2.0	NCP
Silicon Press	1.1	NCP
Slide Show Magician	1.3	CP
Smartcom II	3.0A	NCP,//
SoundCap	4.4	CP
Space Edit	2.0	CP,//
SpellNow	1.0	NCP
Spellswell	2.0	NCP
StatView 512+	1.1	NCP
StatWorks	1.2	NCP,//
Stella	1.3	CP,//
Straight Talk	2.08	NCP,//
Studio Session	1.4	CP
SuperPaint	1.00	NCP,//
Switcher	5.1	NCP
System (MFS-128K)	2.0	NCP
System (HFS)	4.3	NCP
Telescape Pro VT 100	1.3	NCP
Tempo	1.2	NCP
ThinkTank 512	1.3	NCP
Thunder!	1.0.1	NCP
Thunderscan	4.0	NCP
TML Pascal	2.01	NCP
TMON	2.8	NCP
Top Desk	3.0	CP
TOPS	2.0	NCP,//
Trapeze	2.0a	NCP,//
Turbo Maccountant	2.0	NCP,//
Turbo Pascal	1.1	NCP,//
VersaTerm	3.0	NCP
VersaTerm Pro	2.0	NCP
VideoWorks II	2.0	NCP,//
VIP	2.2	NCP
Widgets	3.0	NCP
Word	3.01	NCP
Write	1.0	NCP,//
WriteNow	1.0	NCP,//
XPress	1.1	CP/NCP,//
ZBasic	4.0	NCP

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3. Look at the answer
4. You're done

You can then tell Eureka to

- Evaluate your solution
- Plot a graph
- Generate a report, then send the output to your printer, or a text or MacWrite file
- Or all of the above

You can key in:

- A formula or formulas
- A series of equations—and solve for all variables
- Constraints (like X has to be < or = 2)
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- User-defined functions
- Built-in statistical & financial functions
- Unit conversions
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- 68881 math coprocessor chip support
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- Built-in and user-defined math and financial functions
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- Polynomial finder
- Inequality solutions
- Supports Macintosh II color monitor

Minimum system requirements:
Macintosh with 512K RAM, 128K ROM minimum. One 800K disk drive.

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That Machine That Goes BEEEP!

"And get me that machine that goes BEEEP!" If you've ever found yourself shouting that at your hunchbacked, one-eyed lab assistant, Igor, only to have him gaze back at you with an expression of childlike incomprehension, you're in luck. Put the little guy out to pasture, and take a look at the MacPacq from Biopack Systems.

The MacPacq connects via the modem or printer ports, and brings data acquisition and device control to the Mac by making it possible to record data from microphones, solar cells, encoders or control devices. In fact, the MacPacq, paired with its accompanying software, *PacqManager*, can actually capture information from up to sixteen different sources simultaneously.

Of course, Igor did have one advantage: You could take him into the field. Well, MacPacq can go on the road, too. It can be disconnected from the Mac and it will continue to process and store data that you can later recover and write to disk.

The MacPacq system, including *PacqManager*, costs $995; Pascal, BASIC and C interfaces are also available for those needing custom applications.

To help Igor on his way to early retirement, you can reach Biopac Systems at 42 Aero Camino, Suite 215, Goleta, CA 93117; (805) 968-8880. — *RI*

Proper Breeding

"What a book a devil's chaplain might write on the clumsy, wasteful, blundering, low, and horribly cruel works of nature." No, it's not a description of Congress. These words of wisdom come from the pen of Charles "The Origin of Species" Darwin, who realized that even the most grotesque creatures nonetheless played a crucial role in the evolution of new species.

The Blind Watchman is an unusual program that lets you observe and control the on-screen evolution of "creatures" bright and beautiful, as well as dim and grotesque. The program is a companion to the best-selling book by Richard Dawkins, an evolutionary (and sometimes revolutionary) biologist at Oxford University. The title refers to the anti-evolutionist claim that the complexities of nature imply an underlying predetermined purpose, just as the existence of an intricate mechanical watch implies the existence of a skilled watchmaker. Dawkins' retort is that nature is indeed a blind, or purposeless, watchmaker, and his program demonstrates that random mutations can, in fact, lead to structures displaying the rich variety found in nature.

The program starts with an array of simple graphics, called biomorphs. They might, for example, all be roughly in the shape of a double helix. All the biomorphs in the first generation look similar, but there are minor differences among them, reflecting the variation in the gene pool for a given species. The user selects two biomorphs for breeding, and the program generates the next generation. Typically, after a few generations, the biomorphs will have evolved into creatures that look nothing at all like the first generation — a new species is born. Various parameters — "genes" — control the degree of variation and mutation levels from generation to generation.

The results can be astonishing. Even without trying to intentionally "breed" for any particular characteristics, the biomorphs can evolve from simple geometric shapes into surprisingly complex and often lifelike forms. The key is that the program — and nature — uses a process that, while random, is also cumulative. Dawkins explains this using an often-cited task of random selection: How long would it take for a monkey typing (or a computer generating characters) randomly to produce the works of Shakespeare?

Dawkins calculates that, using a completely random algorithm, it would take even the fastest computers more than the lifetime of the universe to generate even a single sentence of Shakespeare by chance. But if the character-generating algorithm retains the letters which best match the target sentence (paralleling nature's principle of survival of the fittest), this cumulative process will begin waxing poetic in only a few generations. It is a similar cumulative selection algorithm in *The Blind Watchmaker* that is responsible for the rapid evolution of biomorphs from primordial ooze to complex life-forms.

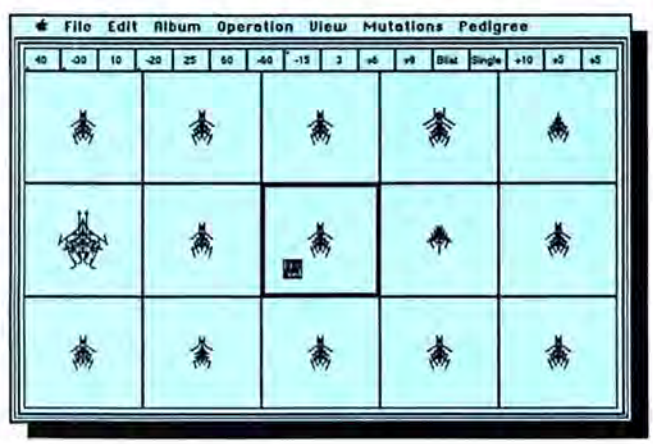
Genetic algorithms, as they're called, are part of the burgeoning field of artificial life. These kinds of techniques, combining intelligence with randomness, are being hailed as effective new tools for designing everything from windmill blades to airplane wings, according to Dawkins.

The program lets you save particularly interesting biomorphs for future breeding experiments. Dawkins is offering a $1000 prize to the first person to duplicate a biomorph resembling a jewelled chalice (dubbed the "Holy Grail") biomorph, which was created with the program, but whose genetic formula (the parameters that would recreate it) was lost.



If you can breed this, it could be worth $1000. But along the way to the jewelled chalice, you'll meet a lot of jumping spiders.

To get the program, you first have to buy the book; it's not sold (and wouldn't make much sense) as a standalone product. The book, published by W. W. Norton, lists for $7.95. You have to mail the original coupon (no photocopies) in the back of the book (the *paperback* edition only) to the publisher, along with $10.95. For more information on the program or the contest, contact W. W. Norton & Co., 500 Fifth Avenue, New York, NY 10110. — *JZ*





Storage Without Space

The Everex EMAC-40/60 DTL is the perfect combination for adding a high speed 40MB hard drive and a high performance, 60MB tape drive to your Macintosh™ Plus or SE. The EMAC-40/60 DTL fits right under your Mac — storage without space.

The hard disk's 28 ms access time and the tape unit's 3.5MB per minute backup speed are among the fastest in the industry. Speed, along with ease of use and affordable pricing, are a hard to beat combination.

The EMAC tape and disk utility software is installed on the hard disk, with the Apple® system folder already loaded for you. With our exclusive EMAC tape software, you can do a file by file or image backup and restore. Our powerful software also lets you backup multiple volumes in one session and on multiple tapes. The Everex EMAC-40/60 DTL comes complete with everything you need — connecting cables, terminating resistor and tape cassette.

Now you can have the convenience of hard disk storage and the security of tape backup without the need for any additional desk space. See the entire EMAC line of Macintosh peripherals at your dealer.

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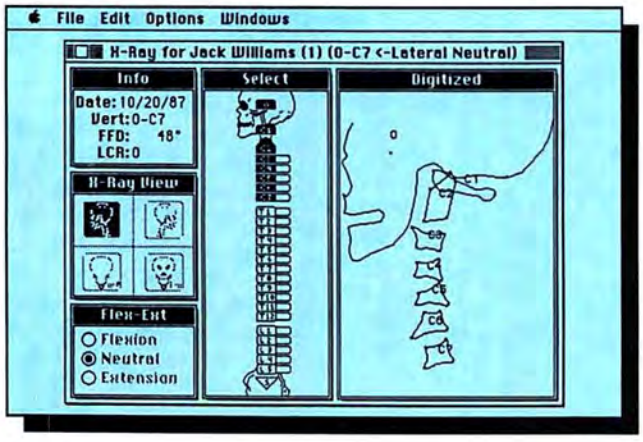
Please circle 151 on reader service card.

X-Rayted

Less than two weeks after Wilhelm Roentgen discovered the principle of the x-ray in 1895, the medical profession was already exploiting x-ray technology to perform previously impossible feats of diagnosis. If Roentgen were alive today, he just might be astonished by *OrthoRad*, a program for analyzing and cataloging digitized spinal x-rays. (He'd also be 143, an equally impressive miracle of modern medicine.)

OrthoRad guides the user (using an optional speech mode or on-screen help) through the process of transferring key data points from the x-ray to the Mac screen using a graphics tablet and stylus. Once entered, *OrthoRad* can perform any of over 40 analyses (everything from Ullman's spondylolisthesis to sacro-illiac symmetry to my personal favorite, height of articular pillar). The x-ray outlines and analyses are stored in a standalone data base, along with each patient's history and vital statistics. X-rays can also be superimposed for making comparisons and tracking the patient's progress.





The program's publisher, HealthCare Communications, notes that the simplified visual format of *OrthoRad* files improves communications between doctors and the non-medical parties involved in a particular case (such as the patient, the family, insurance agents and lawyers). The system lists for $2995, which includes the software and tablet hardware. Contact HealthCare Communications at (800) 422-6227 or at 245 South 84th Street, Lincoln, NE 68510. — *JZ*

TWO WAYS TO MAKE WORKS

From Lundeen & Associates

THE FASTEST SPELLING CHECKER FOR MICROSOFT® WORKS.





Designed by Tim Lundeen,



Stand by Me

Not too long ago, the Mac offered terrific computing power without taking over your work space, but then along came the Mac II, and suddenly your desk became an overgrown computer stand. Ergotron and Kensington have two unique solutions to the Mac II's desktop hegemony.

Ergotron's Mac II Engineering Workstation offers an ideal solution for those using 19 inch monitors. The workstation sits beside your desk as a free standing unit, providing a shelf for the Mac II, and a gas spring-powered arm for suspending the monitor above your work area. The arm can provide 6 inches vertical, 24 inches horizontal, and 180 degree pivoting motions, while the monitor itself can be tilted 20 degrees, and swivelled 360. The arm can support up to 80 pounds, and there's also a lighter duty version of the workstation, with an arm that supports up to 50 pounds. The price for either workstation is $499.95.

For those users who don't need all the features the Ergotrons offer (or who have smaller pocketbooks), Kensington has produced a simple and elegant solution: the Macintosh II Stand, an aluminum stand that holds the Mac II upright, next to your desk and two inches off the floor, for proper ventilation. List price is $29.95.

Whichever solution you choose, you'll need longer cables to plug your Mac II in. So, Kensington has also released a 7-foot ADB Keyboard Cable, and a Macintosh II Monitor Cable Extension Kit that contains 6-foot extension cords for both power and video. The ADB cable lists at $39.95, and the Monitor Kit, at $49.95.

For more information, you can reach Ergotron at 1621 E. 79th St., Minneapolis, MN 55420, (612) 854-9116 or (800) 328-9839. You can call Kensington at (800) 535-4242. For those outside the US, or in New York, Kensington's number is (212) 475-5200. — *RI*



WORK EVEN HARDER.

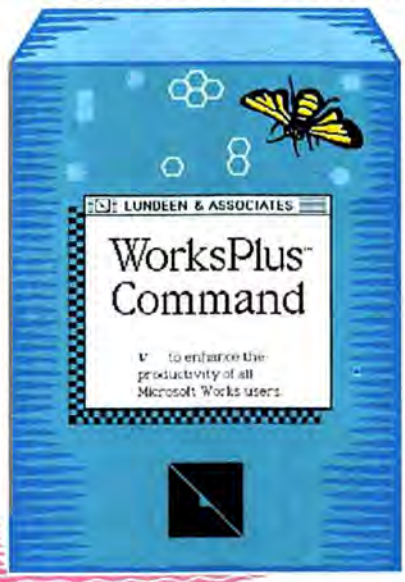
It zips through your finished documents five times faster than any other spelling checker—at about two pages per second. Or if you prefer to check each word as you type, WorksPlus Spell will do it without slowing you down.

There's a 73,000 word dictionary at your fingertips. Plus you can customize both the standard and document dictionaries by adding or deleting words.

Spell even has a glossary for frequently used phrases, and an automatic hyphenation feature.

All this is combined in a package that's exceptionally easy to use and fully-integrated with Works. And that puts time on your side.

THE MOST POWERFUL MACRO PACKAGE FOR MICROSOFT® WORKS.



Put an end to tedious, repetitious typing with WorksPlus Command.

The pre-programmed commands allow you to perform entire sets of functions with a single keystroke. Select a style rule, generate a table of contents or index, perform global search and replace and more.

You can even print multicolumn labels from a database.

Command can also be used to create your own personal commands simply by recording keystrokes or mouse clicks. Plus there's a full programming language so you can further extend and customize Works.

And since Command adds menu items directly to the Works program, it becomes part of it, working as the perfect software partner.

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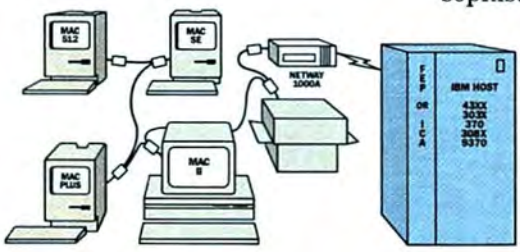
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one of the principal developers of Microsoft Works.

How your Mac family and your 3270 family can be one big happy family.

Your Macintoshes and your mainframe. They have some truly amazing capabilities. Except for one: the ability to easily talk to one another.

But there is a universal solution that unites all your Macs —the 512 KE, the Plus, the SE,



Corporate workgroup using AppleTalk.

and even the Mac II—with your 3270 world. It's Tri-Data's NETWAY 1000A.

This 3270 gateway for your Macs delivers perfect 3274 controller emulation. So it doesn't compromise your SNA or Bisync mainframe environment one bit.

Since we connect to AppleTalk, you are part of a local area network filled with high-end workgroup solutions. Giving you the best of both worlds: 3270 workstation capabilities and a sophisticated LAN.

But that's not all. With our file transfer capability, your Mac and mainframe can exchange text, Mac application files, binary files, and even IBM PC files.

And with our Multifinder compatibility, you can integrate an IBM host session with several Mac applications. Without disconnecting from the host.

Given all these capabilities, you may think NETWAY 1000A is an expensive solution. Well, you're in for a pleasant surprise. For a workgroup of 16 Macs, NETWAY 1000A costs less than $200 per active 3278 terminal session.

And if all this sounds too good to be true, here's another pleasant surprise. Tri-Data's NETWAY 1000A has been delivering the best Mac-to-mainframe solutions for more than two years. For many of the biggest names in the Fortune 1000.

The Tri-Data NETWAY 1000A. Exactly what your Mac family, 3270 family, and, ultimately, your corporate family needs.

Contact us about our demo program and connect your Macintosh to your IBM host today. Tri-Data, 505 E. Middlefield Road, Mountain View, CA 94043, Telex: 172282, AppleLink: D0120, (415) 969-3700.

TRI-DATA

Satisfying our customers for 20 years.

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by Robert R. Wiggins

Complex Insecurity

In his book *1984,* George Orwell envisioned a future society where every aspect of a person's life was watched and controlled by the evil Big Brother. We are now four years past that infamous year, and have avoided the dismal fate Orwell had in store for us. Or have we?

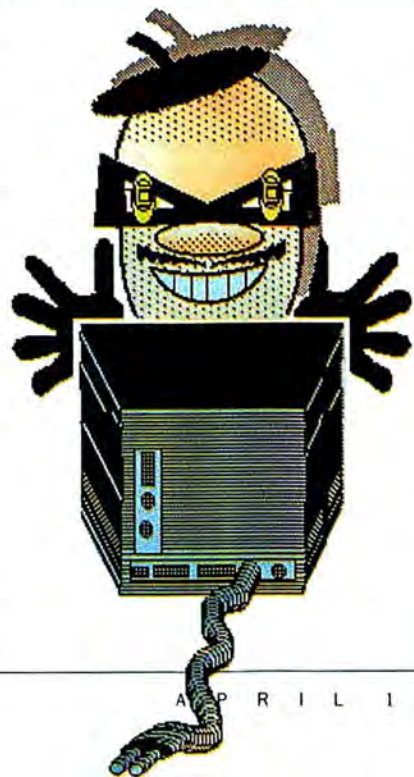
When you walk into a store and purchase a product with a credit card, most of the time the credit card company is immediately informed of the purchase (and makes the decision to accept or deny the charge) via telecommunications. As point-of-sale terminals become more sophisticated, you may not even know it is happening. If your business accepts major credit cards, you are probably familiar with the approval systems.

When you apply for a loan, a credit card or try to rent an apartment, a computerized credit check is usually run on you, and almost every aspect of your financial life is scrutinized. Thanks to federal legislation, there are now ways to see your credit report and offer rebuttals for inaccuracies that may have gotten into your report. Prior to these laws, there were many horror stories about false and even malicious information that had been carried in some credit reports and widely circulated. TRW, the largest credit reporting service, in a brilliant marketing move, is even selling a service to allow you to periodically review and update your credit history (something you can do for free if you are denied credit based on a TRW report).

When you have a brush with the law, no matter how minor, they can tap into the FBI's National Crime Information Center (NCIC) computer and instantly find out if you've ever been arrested or otherwise managed to get into any law enforcement files. The FBI Advisory Policy Board last year approved proposals to link NCIC to IRS, INS, Social Security, SEC and several other data bases, and to create a system to track anyone *suspected* of a crime. More and more organizations, including private companies, are pushing to gain access to this system and, in the absence of legislation, the same excesses that used to be possible in credit reporting will be extended to law enforcement. Orwell may not have been so far off.

But what does this have to do with either the Macintosh or your business? Unfortunately, plenty. One of the things that has allowed systems like the ones described to grow has been assurances to the Congress and other parties who could stop them that the information is secure. And in the mainframe world which most of these systems inhabit, that was often true — unauthorized access was difficult and expensive to accomplish. Access to these systems was often via hardwired terminals, and access to the terminals could be controlled physically. Over the years, dial-up systems have become increasingly common, but the additional threat to security was still small, since terminals and modems were expensive and hard to use.

But the microcomputer age has changed all that. Now there are millions of potential "crackers" across the country, who with a personal computer and modem can attempt access to these systems. There are big news stories when one succeeds (and is caught, of course). So the "protected" data about you and your finances and criminal record are not as secure as you may have thought. If you have sensitive information about your own company or your customers in your own computer, you face the same danger. Several of the incidents reported in the press have involved "crackers"getting into private company data bases, not government systems.



DIDIER CREMIEUX

Intrusion by telecommunicators may get all the headlines, but it is only the tip of the iceberg. There are many more general security issues, including simple theft, theft of data, destruction of data. So even if you allow no dial-up access to your systems, and your only computer is a Macintosh, you still face risks.

Ironically, many of the advantages of the Macintosh become disadvantages from a security standpoint. The Mac is lightweight and transportable, so thieves can easily walk off with it (along with any data on the internal hard disk). Mac floppies fit easily in one's pocket, so sensitive data can be carried off your premises undetected (including data downloaded from your mainframes). The Mac interface is simple to learn and use, so strangers have an easier time getting into your files (those TV scenes of an intruder instantly getting information out of a computer are no longer as ludicrous as they once were).

What can you do to protect your company? Unfortunately, not all that much, although with some simple planning and common sense you can limit your exposure. Here are some simple things you should consider adding to your routine:

1. Back up your data often, and store at least one copy off-site. The cost of losing your data, either through accident, fire, theft or the actions of a disgruntled employee could be your business. Even if it can be reconstructed, consider that cost compared to the cost of backing up, and it's no contest. Off-site storage is an added precaution which is very easy to accomplish.

Programs & Peripherals

Picks of the Month



MacMoney 3.0 by Survivor Software Ltd.



Do you know how much you spent traveling so far this year... how about how much that dog has cost you... whether your company has reimbursed you for all those business expenses? ***MacMoney*** answers these questions easily. All you have to do is enter checks, deposits, credit card purchases and cash transactions. You can enter these transactions and disburse the amounts over up to eight categories, print checks, print reports or export information for further analysis. With *MacMoney* you can create a simple or complex system — you're the boss — it's your money!

MacMoney 3.0 **69.**

Tempo II by Affinity Microsystems



Tempo II can take a series of keystrokes or mouse clicks and turn them into a one key code. Whether your macro just selects a font or performs hundreds of steps through multiple programs, *Tempo II* replays it all with a single keystroke. And as your needs grow, *Tempo II* meets them. Transfer directly between applications, auto-paste text and graphics, repeat your commands 100's of times, wait until midnight then run — great for automating data transfers!

Tempo II..... **89.**

Fanny Mac by Beck-Tech



Cooler computers reduce premature failure of electronic components. ***Fanny Mac*** is a quiet, elegant way to boost the ventilation on your Macintosh because it fits discreetly into the handle recess on your Mac and utilizes a quality BALL BEARING fan mechanism. And, it's low profile mount maintains the sleek appearance of your Mac as its designers intended!

Fanny Mac *(Available in Beige or Platinum)* **65.**

Utility Software

Apple Computer		**Software Supply**	
Switcher Construction Kit	14.	Suitcase or Power Station	38.
ALSoft Disk Express 1.10	26.	**SuperMac Software**	
Berkeley System Design Stepping Out	55.	SuperSpool	42.
CE Software		SuperLaserSpool	82.
QuicKeys *(Macro Program)*	59.	Multi-User SuperLaserSpool	199.
DiskTop 3.0	31.	Diskfit 1.3	54.
CalendarMaker 3.0	31.	Network Diskfit 1.3	205.
Central Point Software		Sentinel	155.
Copy II Mac *(Includes MacTools)*	20.	**TOPS**	
Fifth Generation Systems		Tops For The Macintosh 2.0	119.
FastBack For The Macintosh	59.	Tops PRINT	Call
Infosphere		Tops For The PC	Call
MacServe *(Network Software)*	163.	**Williams & Macias**	
LaserServe *(LaserWriter Print Spooler)*	63.	myDiskLabeler	31.
Olduvai Software ADBridge	107.	myDiskLabeler w/ Color	31.
DA-Switcher II	25.	myDiskLabeler	
Icon-It! *(Assign Icons to Menu Items)*	39.	w/ LaserWriter Option	34.
Read-It! TS *(For Thunderscan)*	79.	**Working Software, Inc.**	
Read-It! O.C.R. *(For Image Scanners)*	159.	Findswell *(Document Finder)*	29.

Desk Accessory Programs

Affinity Microsystems Tempo II	*Special* 89.	**Imagine Software**	
Tempo I.2	53.	Smart Alarms & Appointment Diary	35.
AffiniFile	*Special* 46.	Multi-User Appointment Diary	
Borland SideKick V2.0	65.	with Smart Alarms	89.
Cortland		**Solutions, International**	
Top Desk	32.	SmartScrap & The Clipper	35.
Greene, Inc. QuickDex 1.4	24.	**Symmetry** HyperDA *(Req. 512K)*	45.

Languages

Apple Computer MacPascal	99.	**Microsoft**	
Borland Turbo Pascal	65.	Microsoft Basic Interpreter 3.0	62.
Turbo Pascal Numerical Methods	65.	Microsoft Basic Compiler 1.0	119.
Turbo Pascal Tutor	46.	Microsoft Fortran Compiler 2.2	169.
Consulair		**THINK Technologies** Lightspeed C	109.
Macintosh 68000 Development System	59.	Lightspeed Pascal	65.
Mainstay		CAPP's for Lightspeed C	49.
V.I.P. *(Visual Interactive Programming)*	85.	CAPP's for Lightspeed Pascal	49.

Communications Software

Apple Computer MacTerminal	99.	**Think Technologies, Inc.**	
Compuserve Compuserve Starter Kit	24.	InBox-Starter Kit V2.0	
DataViz MacLink Plus with Cable	145.	*(3 Personal Connections)*	209.
Freesoft Red Ryder V9.4	64.	InBox-Mac Connection	79.
Software Ventures		InBox-PC Connection	
Microphone 1.1 *(Includes Glue)*	119.	*(Req. AppleTalk Card)*	125.

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Preschool Disk 1 (3-7), Preschool Disk 2 (3-7), CoinWorks (4-12), ClockWorks (4-10), Early Elementary 1 (6-9), Lemonade Stand (6-16), FlashWorks (6-adult), Naval Battle (6-adult), Word Search (6-adult), Alphabetizer (7-adult), EarthWorks (10-adult), or BodyWorks (10-adult).

Each Program **29.**

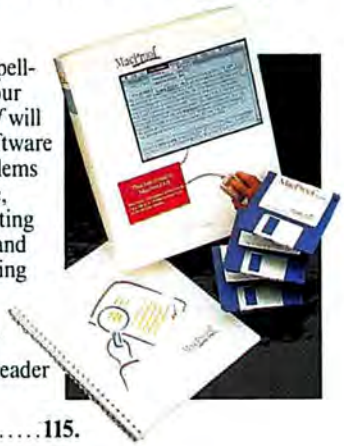
AffiniFile by Affinity Microsystems



AffiniFile is a desk accessory filing program which stores text and graphics as a combination note pad/scrapbook organized by topics and subtopics in color graphics or black and white. Each file you create can include hundreds of topics and subtopics and every file card shows its topic, subtopic and related topics. And, *AffiniFile* can also be used as a Help File for a specific application — so you're able to create your own customized help screens for your favorite applications.

AffiniFile **46.**

MacProof 3.0 by Automated Language Processing Systems



MacProof is a grammar, style and spelling checker DA that's like having your own personal copy editor. *MacProof* will work with most word processing software and checks your document for problems in four areas: style, usage, structure, and mechanics. Trouble spots in writing such as punctuation, capitalization and double words are checked as is spelling with *MacProof's* 80,000 word dictionary. Avoid mistakes and learn to be a better writer with *MacProof* the most advanced electronic proofreader available!

MacProof *(MacPlus, SE, MacII)*..... **115.**

Micro Planner Plus by Micro Planning International



Micro Planner Plus is the most powerful yet easy-to-use project and resource management software available on any Micro. *Micro Planner Plus* handles progressing, target seeking, resource leveling, multiple projects and "what if" analysis. Choose to have customized PERT, GANTT and other management reports drawn for you with the option of embellishment in MacDraw. Bring your projects in on time with *Micro Planner Plus.*

Micro Planner Plus **279.**

ThunderScan 4.0 with Power Port by Thunderware



Ever since ***ThunderScan*** started zipping back and forth inside the ImageWriter, it's been famous for eye-popping graphics. Now, the most popular Macintosh scanner is better than ever with true halftone capabilities, special effects, and more. *ThunderScan* images can now be saved in a variety of formats providing complete compatibility with PageMaker 2.0 and other desktop publishing programs. Grace the pages of your publications with honest-to-goodness halftones from *ThunderScan* and it's software palette that lets you alter any image to your art's desire!

ThunderScan 4.0 with Power Port **199.**

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Laser Printers & Digitizers

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TurboScan	1329.
Impulse	
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Koala Technologies Corp.	
MacVision *(Digitizer)*	169.
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Summagraphics MacTablet 12x12 size	379.
ThunderWare	
ThunderScan V4.0 with Power Port *(Mac 512K, 512K Enhanced, MacPlus, and Macintosh SE)*	***Special*** 199.
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Accessories

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ProPoint *(ADB TurboMouse for Mac SE & Mac II)*	119.
Bech-Tech	
Fanny Mac *(Beige or Platinum)*	***Special*** 65.
Cambridge Automation	
Numeric Turbo	99.
Central Products	
MacOpener *(All In One Mac Tool)*	16.
Curtis Manufacturing	
Diamond-Surge Suppressor-SP-1	29.
Emerald-Surge Suppressor-SP-2	36.
Ruby-Surge Suppressor-SPF-2	55.
Sapphire-Surge Suppressor-SPF-1	47.
DataDesk	
MAC-101 Keyboard/Beige *(128k/512k & MacPlus)*	139.
MAC-101 ADB Keyboard/Platinum *(Mac SE & Mac II)*	139.
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MacTilt or MacTilt SE *(Platinum Color)*	69.
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I/O Design	
Mac Luggage Available in Navy or Platinum Gray	
Macinware Plus Carrying Case	64.
Macinware SE Carrying Case	74.
Imageware II Carrying Case	44.
Kalmar Designs	
Teakwood Roll-Top Disk Cases:	
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Double Micro Cabinet *(holds 90 disks)*	20.
Triple Micro Cabinet *(holds 135 disks)*	28.
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Extra Long ADB Keyboard Cable	25.
Macintosh II Stand	20.
Macintosh II Monitor Cable Extension	33.
Mouse Pocket *(Reg. or ADB)*	8.
Mouseway *(Mousepad)*	8.
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Lightgate Felix *(Second Generation Pointing Device)*	82.
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A+ ADB Mouse *(Mac SE/Mac II)*	69.
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Modems

Epic Technology		**Migent**	
Epic 2400 I *(Internal for the Mac SE)*	299.	Migent Pocket Modem *(ext. 300/1200 Baud)*	169.
Epic 2400 II *(Internal for the Mac II)*	299.	**Prometheus**	
Epic 2400 Plus External	155.	Promodem 1200 *(Hayes Compatible)*	239.
Hayes Microcomputing		Promodem 2400 *(Hayes Compatible)*	309.
Smartmodem 1200	299.	Mac Pack w/Procom M and Cable *(Specify Mac or MacPlus)*	49.
Smartmodem 1200 Mac w/Smartcom II & Cable *(MacPlus)*	359.	**U.S. Robotics**	
Smartmodem 2400	449.	Courier 1200 *(Hayes Compatible)*	199.
Transet 1000-128K	269.	Courier 2400 *(Hayes Compatible)*	349.
Transet 1000-512K	429.	Courier 2400E *(Hayes Compatible)*	379.
Transet 1000 Mac Accessory Kit	29.	Courier HST 9600 *(Hayes Compatible)*	689.

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Nashoba Systems FileMaker Plus	149.
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ProVUE Development OverVUE 2.1	149.
Software Discoveries RecordHolderPlus	45.

Business Software

Apple Computer MacProject	159.
Bravo Technologies MacCalc	79.
Cricket Software Cricket Graph	119.
Cricket Presents...	289.
Pict-O-Graph	105.
Deneba Software Comment	59.
Xtra 2.0	109.
Layered	
Notes For Excel, Jazz, PageMaker, Microsoft Works or Word 3.0 *(each)*	41.
Legisoft/Nolo Press WillMaker 2.0	30.
Lotus Jazz 1A	189.
Lundeen & Associates	
WorksPlus Commands	62.
MacroPac International	
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Mainstay Think 'n Time	69.
Micro Planning Software	
Micro Planner Plus	*Special* 279.
Microsoft	
Microsoft Works 1.1	179.
Microsoft Multiplan 1.11	110.
Microsoft Chart 1.02	72.
Microsoft Excel 1.04	224.
Microsoft PowerPoint	Call
North Edge Software Timeslips III	119.
Satori Software Bulk Mailer 3.0	79.
Bulk Mailer Plus	195.
Legal Billing	369.
Legal Billing II	539.
Project Billing	409.
Turner Hall Publishing MacSQZ!	59.

Word & Outline Processors

Apple Computer MacWrite	99.
Living Videotext	
More 1.1C *(Color Version)*	175.
Microsoft Microsoft Word 3.01	239.
Microsoft Write	109.
MindWork Software MindWrite 1.1	159.
Symmetry Acta V2.0	36.
T/Maker Company WriteNow	98.

Spelling & Grammar Checkers

Aegis Development	
Doug Clapp's Word Tools	42.
A.L.P. Systems MacProof 3.0 *(Requires MacPlus)*	*Special* 115.
Batteries Included	
Thunder! 1.23	31.
Deneba Software Spelling Coach 3.0 *(Webster's/Medical/Legal/Hyphenation)*	59.
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Microlytics, Inc.	
Word Finder *(Synonym Finder)*	39.
Sensible Software Sensible Grammar	57.
Working Software, Inc.	
Spellswell 2.0	42.
Spellswell Medical or Legal Dictionary	57.
Lookup *(Makes Spelling Suggestions)*	29.

Desktop Publishing

Addison-Wesley TEXtures	279.
Aldus Corporation PageMaker 3.0	475.
Allan Bonadio Associates	
Expressionist 1.11	49.
Ann Arbor FullWrite Professional	169.
Boston Publishing Systems	
The MacPublisher III	119.
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ImageStudio	279.
Posteraft International, Inc.	
Laser FX	119.
Quark, Inc. QuarkXPress	479.
Solutions, International Super Glue	52.
Target Software Scoop	299.
Word Perfect Corporation	
Word Perfect for the Macintosh	189.

Accounting Packages

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Rags to Riches 3-Pak 3.1 *(GL/AR/AP)*	289.
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Migent In House Accountant	99.
Monogram Business Sense	279.
Dollars & Sense 4.0	81.
Peachtree	
Back To Basics 3-Pak *(GL/AR/AP)*	139.
Softview MacInTax Federal 1987	65.
California or New York Supplement *(1987)*	39.
TaxView Planner *(1987-1991)*	45.
Survivor Software MacMoney 3.0 *(Enhanced Version)*	*Special* 69.

Statistics & Math Packages

BrainPower	
StatView 512 Plus	175.
Math View Professional	145.
Borland Eureka! The Solver	129.
Systat Systat 3.1 *(Specify Mac 512K, MacPlus, or Mac II)*	459.

Graphics Software

ABA Software Draw It Again Sam...	89.
Adobe Systems Adobe Illustrator *(MacPlus, SE & Mac II)*	379.
Aldus Freehand	379.
Altsys Corp. FONTastic *Plus*	47.
Fontographer 2.2	239.
Ann Arbor Softworks Full Paint	49.
Apple Computer MacPaint	99.
Broderbund Print Shop	37.
VideoWorks II	118.
Casadyware Fluent Fonts 2.0 *(2-Disk Set)*	27.
Fluent Laser Fonts Vol. 1-15 *(ea)*	46.
Computer Friends Modem Artist	129.
Deneba Software Canvas 1.0 *(Includes Desk Accessory)*	109.
Canvas DA	59.
Dubl-Click Software	
World Class Fonts! *(Both Volumes)*	36.
WetPaint *(Both Volumes)*	36.
Enzan-Hoshigumi USA	
MacCalligraphy 2.0	109.
Japanese Clip Art Scroll 1 *"Heaven"* or Scroll 2 *"Earth"*	57.
Japanese Clip Art *"Borders"* Scroll	69.
Foundation Publishing	
Comic Strip Factory	45.
Comic People	26.
Micro: Maps MacAtlas Paint Version	32.
MacAtlas Professional	129.
Miles Computing	
Mac The Ripper, Orchestra of Fonts, People-Places-Things, or Taking Care of Business *(each)*	27.
Mindscape ComicWorks	47.
GraphicWorks 1.1	87.
Olduval Software	
Post-ART *(3-Disk Set)*	35.
Silicon Beach Software	
Digital Darkroom	114.
SuperPaint	79.
Silicon Press	41.
Solutions International	
The Curator *(Catalog Your Art)*	79.
Springboard Certificate Maker	24.
SuperMac Software Pixel Paint	259.
Symmetry PictureBase 1.2	59.
T/Maker	
Click Art Letters I, Letters II, Personal Graphics, Publications, Effects, Business Image, or Holidays *(each)*	28.
Christian Images	35.
Click Art EPS Illustrations	Call
Click Art Laser Fonts: Plymouth, Bombay, or Seville *(each)*	45.
Unison World Chest Top Publishing	34.
Zedcor DeskPaint 1.0	39.

CAD Products

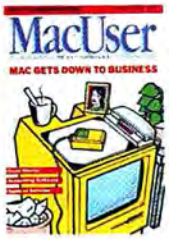
Apple Computer MacDraw	159.
Challenger Software	
Mac 3D *(Enhanced Version 2.0)*	119.
Cricket Software Cricket Draw	169.
Enabling Technologies Easy 3D	79.
Professional 3D	199.
Innovative Data Design	
MacDraft 1.2A	149.
Silicon Beach Software Super 3D	159.
Super 3D Enhanced *(Mac II)*	249.

Educational/Creative Software

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Bogas Productions Studio Session	52.
Broderbund Jam Session	30.
Geometry, Calculus or Physics	62.
Compu-Teach Once Upon A Time	24.
Stepping Stones Level I or Level II	24.
Davidson & Associates Speed Reader II	39.
Math Blaster or Word Attack!	27.
Electronic Arts	
Deluxe Music Construction Set V2.0	61.
1st Byte/Electronic Arts	
Kid Talk, Speller Bee, First Shapes, or Math Talk	32.
Mathtalk Fractions, First Letters & Words, or Smoothtalker	32.
Great Wave Software TimeMasters	22.
KidsTime or NumberMaze	26.
CrystalPaint	32.
Concertware+ 4.0 or American Discovery	39.
Concertware+ MIDI 4.0	79.
Hayden MusicWorks	29.
Score Improvement System for the SAT	58.
Learning Company Reader Rabbit	34.
Mindscape Perfect Score SAT w/The Perfect College	46.
Nordic Software	
MacKids Educational Programs *(each)*	*Special* 29.
Rubicon Publishing	
Dinner at Eight-Silver Palate Bundle	51.
Simon & Schuster Typing Tutor IV	35.
Speed Reading Tutor IV	32.
Springboard Early Games for Young Children or Easy as ABC	28.

Disk Drives/Hard Disks/Upgrades

AST Research	
Mac86 Co-Processor *(Mac SE)*	419.
Mac286 Co-Processor *(Mac II)*	1049.
Central Point	
Central Point 800K External Drive	185.
CMS	
20MB External Subsystem *(MacPlus/SE/II)*	569.
40MB External Subsystem *(MacPlus/SE/II)*	919.
60MB External Subsystem *(MacPlus/SE/II)*	789.
60MB Tape Backup *(MacPlus/SE/II)*	739.
Cutting Edge Cutting Edge 800k Drive	175.
Dove Computer Corporation	
MacSnap 524 *(512K to 1MB)* or 524E *(512E to 1MB)*	139.
MacSnap 524S *(512E to 1MB w/SCSI)*	219.
MacSnap 548 *(512K to 2MB)* or 548E *(512E to 2MB)*	359.
MacSnap 548S *(512E to 2MB w/SCSI)*	449.
MacSnap Plus 2 *(MacPlus to 2MB Non Expandable)*	249.
MacSnap 2S or 2H *(1MB to 2.5MB for MacPlus/SE)*	449.
MacSnap 4S or 4H *(1MB to 4MB for MacPlus/SE)*	879.
SCSI Interface/Port	85.
MacSnap Toolkit *(torx driver, opener & grounding set)*	15.
MacMemory, Inc.	
Turbo SE *(16 Mhz 68000 Accelerator for the Mac SE)*	399.
Motorola 68881 *(Math Coprocessor for Turbo SE)*	349.
MaxPlus Mega *(2MB Upgrade with 1MB Chips for MacPlus)*	345.
Personal Computer Peripherals	
Beige or Platinum Color. Optional Built-In Modems Available.	
MacBottom HD-21 *(20+MB SCSI Hard Disk)*	749.
MacBottom HD-32 *(32MB SCSI Hard Disk)*	879.
MacBottom HD-45 *(45MB SCSI Hard Disk)*	1139.
MacBottom 20 *(20+MB Serial Hard Disk for Mac 512k & MacPlus)*	839.
Rodime Rodime 20 Plus *(External 20MB SCSI)*	629.
Rodime 201 Plus *(Internal 20MB for MacPlus)*	629.
Rodime 45 Plus *(External 45MB SCSI)*	939.
Rodime 450RX *(Internal 45MB for Mac SE & Mac II)*	829.



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2. Lock up your equipment when not in use. If possible, double-lock your floppy or hard disks containing sensitive data. A locked drawer or file cabinet in a locked office won't stop a determined thief, but it will slow them down while discouraging the casual thief or miscreant. The Macintosh is even portable

Ironically, many of the advantages of the Macintosh become disadvantages from a security standpoint.

enough for a trip to a locked closet. And don't think you're immune. A financial company in New York had several Macs stolen from their 17th floor offices. The thieves came in through the windows.

3. Buy a security software package, and use it. There are several encryption packages available, which make purloined data unusable since it is unreadable without the proper key to decode it. There are also packages to password-protect disks, for those times you can't lock up the disks (such as internal hard disks).

4. Avoid dial-up systems. If you can't avoid them, try to keep sensitive data protected or on other systems, and look into dial-back systems, that call back users at designated phone numbers to prevent unauthorized access.

5. Consider the implications of mainframe connectivity. That highly protected mainframe data surrounded by guards and security systems can easily be downloaded to a 3.5-inch floppy, slipped in a pocket and carried off. There's not much you can do about it, other than depend on mainframe security software packages.

6. Consider the implications of networking. Networking is extremely popular, but it increases the number of people with access to your data, without as many safeguards as are possible in the mainframe world.

Naked!

That's how you leave your hard disk without *The NightWatch*™ & *MacSafe*®



Sorry to startle you, but the naked truth is that if you're not using ***The NightWatch*** & ***MacSafe*** to protect your hard disk files, anyone with access to your Macintosh can browse freely through your files — even changing them without your permission, or knowledge. And it could be tonight!

With ***The NightWatch,*** you can shut down your hard disk securely when you leave the office. All night long, ***The NightWatch*** stands guard, preventing unauthorized access or erasure of your hard disk. When you come in the next morning, start up with ***The NightWatch*** user disk & enter your valid name and password. A simple & elegant security solution.

If you share your Mac during the day, then ***MacSafe*** can help you restrict access to individual documents & applications. With ***MacSafe***, you create folder-like safes and place the files in them you want to protect. It works much like the Finder, so you already know how to use it. With ***MacSafe's*** true password protection system (no encryption required), no one will be able to get into your safes without the correct password. Simple, familiar, & fast.

Join our satisfied customers from Fortune 100 companies, universities, and small businesses in protecting your valuable files with ***The NightWatch*** & ***MacSafe***. *MacUser* magazine said that with ***MacSafe*** "you can rest assured that your files are in safe territory — 4 mice!"

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MacUser gave WetPaint 5 mice (Sept. 1987)



WetPaint Volumes 1&2

Violet: vol.1 • Orange: vol.2

Each 3 disk volume of **WetPaint** contains an extensive collection of useful pictures, icons, borders, maps and patterns—designed for both home and business use.

WetPaint comes in Fullpaint format (can be read by MacPaint, SuperPaint, etc).

WetPaint is also available in PictureBase format for an additional $15 per volume (order direct when returning your registration card).

MacUser gave World Class Fonts 5 mice (Dec. 1986)



World-Class Fonts Volumes 1&2

Gray: vol.1 • Blue: vol.2

Each 3 disk volume is chocked full of what ***MacUser*** describes as the "best collection of ImageWriter fonts available."

Our fonts come in all sizes and styles, from large display faces to practical text fonts; complete with accent marks, many with fractions, and all with at least one picture.

Also contains the **BigCaps** desk accessory and **Font Charter** program!

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Intrusion by telecommunicators may get all the headlines, but it is only the tip of the iceberg.

Both networking and mainframe connectivity offer many advantages, but consider the downside before wiring everything together.

7. Use common sense. All the other rules really boil down to this one. For example, the *MacUser* offices are always bustling, so sensitive data is not kept on hard disks where a passerby could find it. And while the office is networked, no data files or beta test versions of software are accessible via the network. It's just common sense.

There's really not that much you can do to protect yourself and your company, but some of the things you can do are so simple that not doing them is asking for trouble. If each business secures its own data, we can all go back to worrying only about data in government data bases. And hoping that the government is expending the same effort to keep the data about us secure.

PINSTRIPE PICKS

Some products worth looking into if you use your Macintosh for business:

Ready, Set, Go! 4.0: Another major update to the popular page layout program from Letraset.

WriteNow: (T/Maker) Still a good workhorse word processor being lost in the shuffle of the high-end word processor wars.

Think 'N' Time: (Mainstay) Yet another organizer desk accessory, but with a different kind of interface.

DiskTools Plus: (Electronic Arts) A collection of useful desk accessories written by Evan Gross. Centered around *DiskTools,* an excellent disk and file utility desk accessory.

Not everyone needs Microsoft Excel.

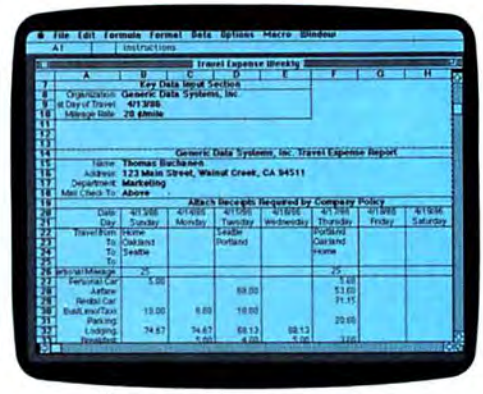
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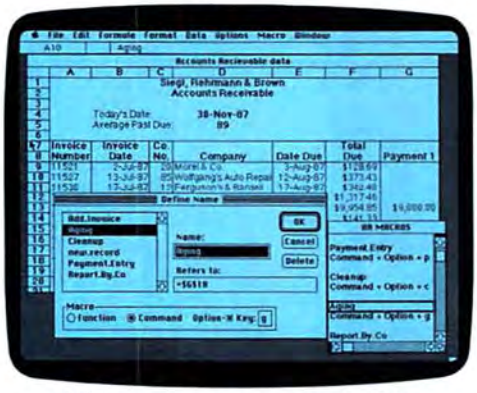
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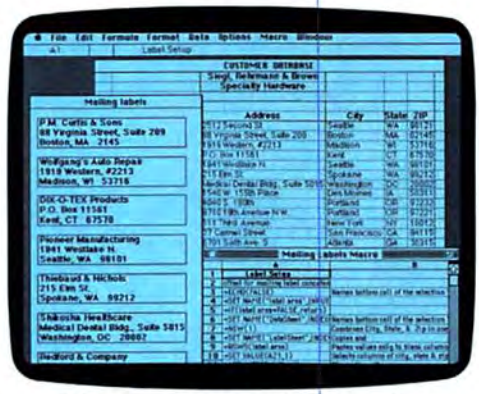
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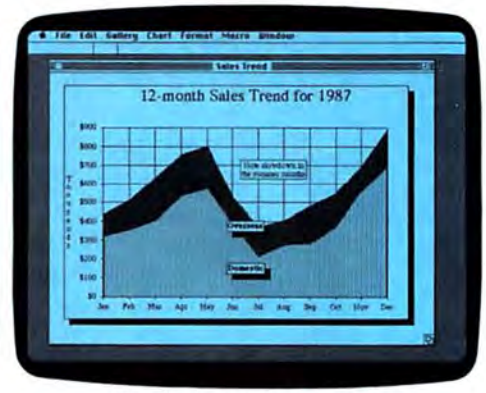
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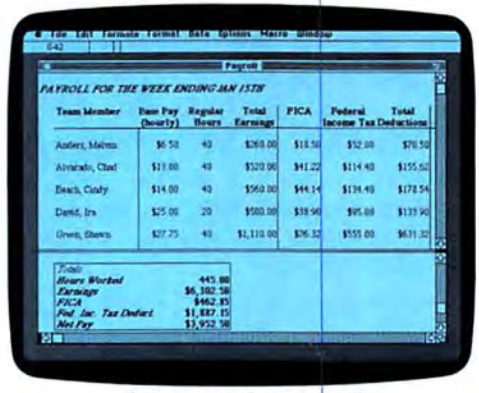
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Invest in stocks.



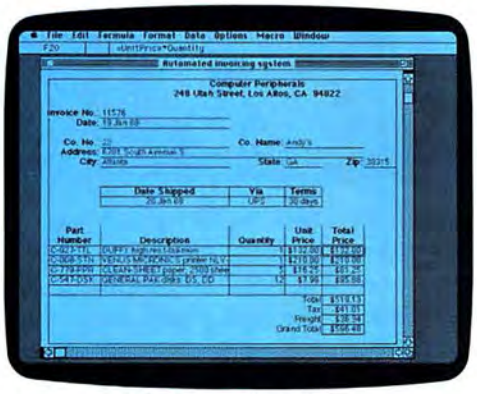
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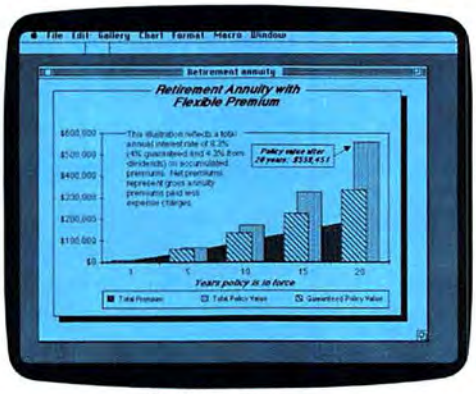
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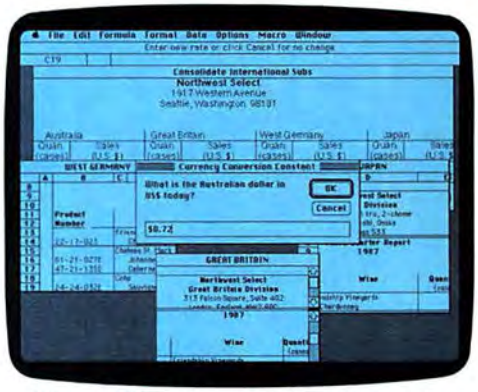
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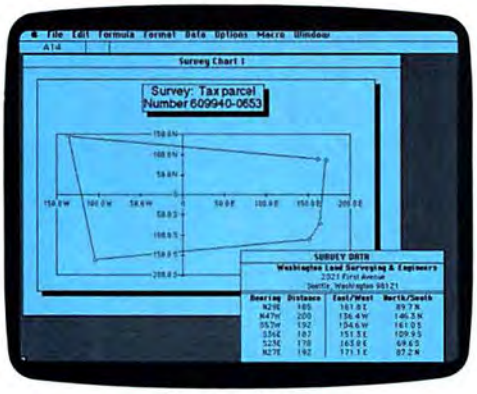
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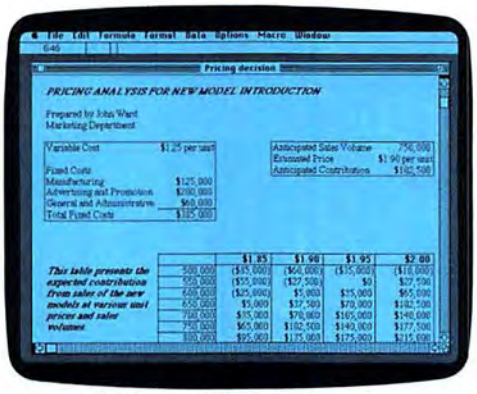
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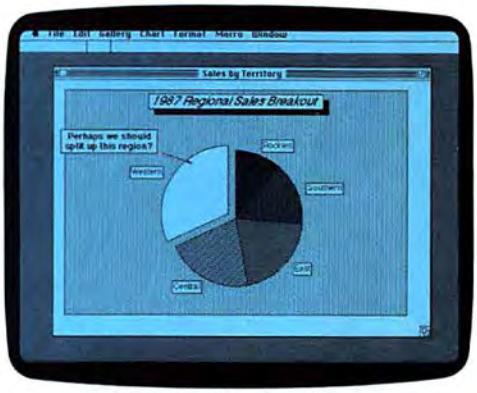
Consolidate international reports.



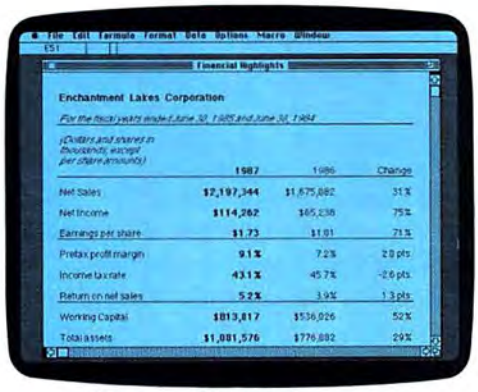
Survey land.



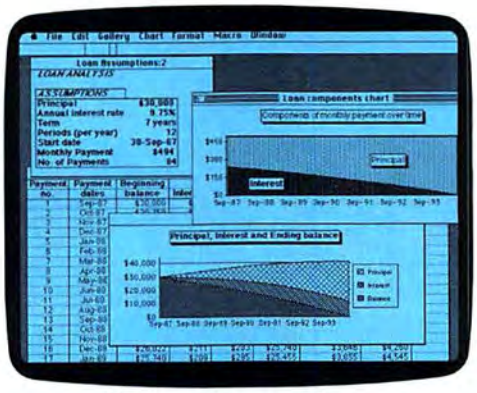
Make pricing decisions.



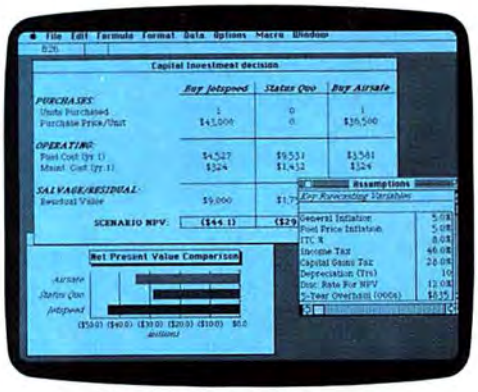
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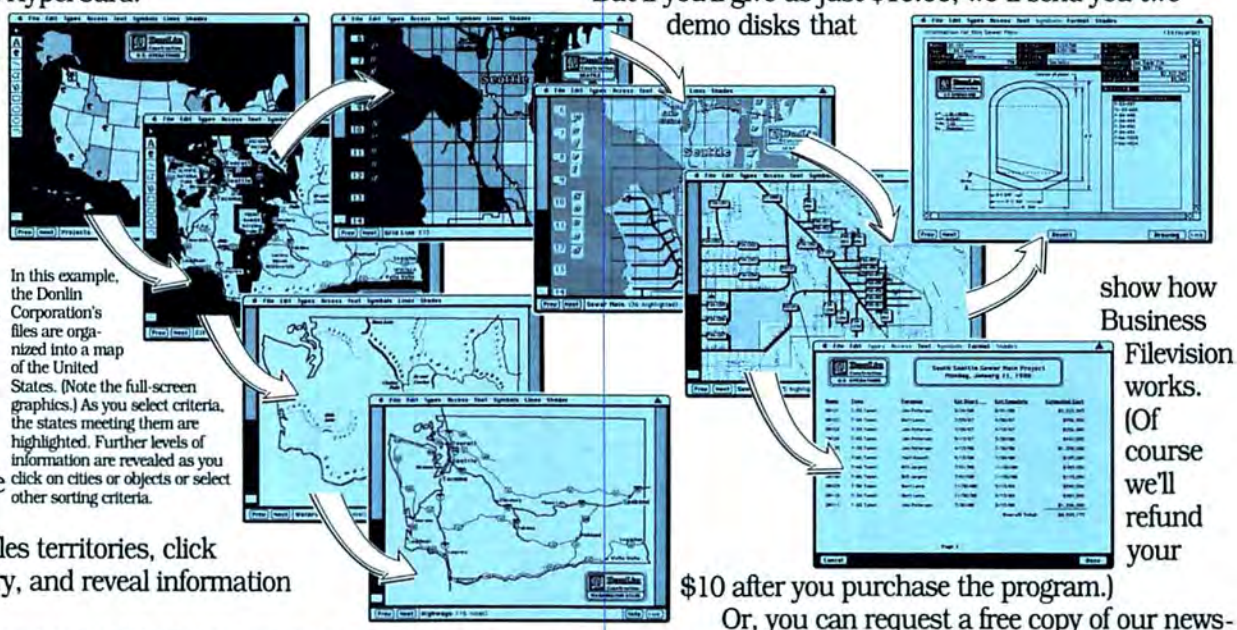
Crazy 3M. Crazy Ford. Crazy DuPont. Crazy Boeing. Crazy Sears. Crazy Westinghouse. Crazy Apple.

Crazy like foxes.

An impressive list of major companies and government agencies that use the Macintosh™ own Business Filevision, the graphic file management system. And they're still ordering copies today. Because Business Filevision will do things that no other program can.

Not even HyperCard.™

So what is Business Filevision, anyway? It's a data base program that stores data using graphics as file directory devices. In other words, you could create (or import) a map of sales territories, click on a territory, and reveal information about it.



In this example, the Donlin Corporation's files are organized into a map of the United States. (Note the full-screen graphics.) As you select criteria, the states meeting them are highlighted. Further levels of information are revealed as you click on cities or objects or select other sorting criteria.

More important, unlike other programs that seem to do similar things, it allows you to select several criteria so that you can sort and analyze data 'behind' the images. You can incorporate computed fields and statistics. And you get real flexibility in reporting. All without learning a programming language.

From the beginning, Filevision was so revolutionary, people were at a loss to describe it, but they were crazy about it. AFIPS* gave it their "Outstanding Software Product of the Year" Award.

Do we expect you to just plunk down your money for a powerful program on the basis of a few advertising claims? We're not crazy.

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by Tom Steinert-Threlkeld

The Suit Case

Call them business users. Call them suits. Whatever.

Call them plentiful. And abused.

A perverse arrogance still pervades the Mac user community. High visibility Mac users too often regard this computer as a work of art not to be despoiled by the unindoctrinated.

The impression that is pointedly left is that if you don't know the inner workings of computers in general and the hallowed Mac in particular, you're ignorant. This kind of commentary appears with dismaying frequency even in this magazine, which is supposedly devoted to all users, not just those capable of machine code programming.

But let's make no mistake about the Mac. Or its users. The Mac is not a computer for the programmer, the avant garde or the purist. It's a business computer. No "ifs," "ands" or "buts." No "could-bes," "would-bes" or "will bes." It already is.

Macintosh may only have a small slice of the business market for personal computers, compared to IBM. Indeed, Kidder Peabody, the investment house, estimates that Macintosh has only 7 percent of the market. IBM and its clones dwarf Mac.

This will not change dramatically. Even doubling Macintosh's market share to 14 percent will take years. After three-and-a-half years, Apple now has a worldwide installed base of 1 million Macs. By contrast, IBM sold its one millionth personal computer by November — of the Personal System/2 line introduced in April.

Still, it does not take a machine code programmer to figure out that business users are not just the future, but the present for Macintosh. Apple is now shipping about 50,000 Macs a month. A full 70 percent of the Macs *currently being shipped* are going to businesses. That means 35,000 Macs a month are being sold to businesses, versus 15,000 a month for individuals or schools.

Let's try that math: That's *at least* two-and-a-half times as many business users as individuals using them at home or students using them at school. And probably 100 times the number that go to hard-core programmers.

Hmmm.

The percentage of business users will increase, rather than decrease. Already two-thirds of the installed base of Macs are in businesses. That is a Mac fact. With the SE and the II — both aimed specifically at addressing needs expressed by business customers — Apple will gain increased access to the only market that makes long-term sense: the business market.

The Mac is and will be used by businesses of all types and sizes. Of Macs already installed in businesses, only 27 percent are in businesses with fewer than 100 employees; 37 percent are in businesses with 100 to 999 employees; and 36 percent, more than a third, are in businesses with more than 1000 employees.

Hang your Suit on that.

The sooner we all realize business use is not just the future, but the present for the Mac, the better. For Apple, business is the market that most appreciates value and performance, not just price. The market that sees savings, not just costs, from computers.

Take ease of use, which everyone wants. To the business operator, that translates to less training time and more productive time. On that basis alone, many businesses can justify Macs over PCs. Savings pay for the machines.

More importantly, Apple can't afford to be dragged into the low end of the market. In the IBM world, clonemakers sell more units than Big Blue. How? By undercutting prices, by cutting out margins. Apple needs those margins to reinvest in technology and innovation. Only by continual innovation will it be able to stay in the market at all.



TONY LIMUACO

Apple can't survive by being "as good" as IBM. Apple can only survive if it is better. Clearly better. Constantly, currently and in the future.

Things, too, won't get any easier.

Take a couple of examples. Maybe combine them into a new cloyingly obscure catch phrase, like the Fort Worth Fear Factor. As in, fear that the Mac could lose touch with its user base.

Fort Worth-based Tandy Corp. may already be working on a Macintosh clone. Chairman John Roach says the purveyor of PC-compatible computers is still "at this point" committed to the IBM world, but won't flatly deny the possibility.

This could create confusion in the marketplace. Tandy's Mac clones would be priced hundreds of dollars below Apple's original Macs. The Macintosh or Macintosh-compatible (how does that sound?) share of the business market could increase. But Apple's own growth could diminish or even drop. The computer sales, quite simply, could go to someone else. At $3.5 billion a year in sales, Tandy is no bit player.

Also in Fort Worth, of all places, another element of the fear is exemplified. Data Tailor has published its 2.0 release of *Trapeze*. An amazing program, when you understand it. But the program is almost too powerful for its own good: Lots of up-front time has to be invested in that understanding, in learning how to use the software properly.

If an independent program like this catches on, you almost need day-long seminars that cost as much as the program, just to explain how to use it. Shades of *Lotus 1-2-3*. Shudders of *Lotus 1-2-3*.

Another example: *HyperCard*. *HyperCard* strays from the Macintosh's basic strength: its consistent user interface. You have to learn yet another way of using the Mac.



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MACazine: "DiskExpress is easy to use. No special or technical knowledge is required. I run DiskExpress ... to restore my hard disk to optimum performance. [It] is a well-designed product which should be packaged with every hard disk sold. I rate it this month's BEST BUY!"

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The fear: That the Macintosh's hallmark ease of use will get lost in the shuffle of trying to provide business with increasingly powerful programs. Programmers must not lose sight of the one-on-one Macintosh relationship that says that making things easy for you is what computing is all about. Adding complexity is not. In business terms: The customer (the user) is king.

Business customers, "suits," if you want, are the ultimate I-don't-care-how-it-works user.

And business customers, "suits," if you want, are the ultimate I-don't-care-how-it-works user.

Take the example of a modem. A "suit" knows what a modem is. But she does not care to know what a "stop bit" or "parity" is. She just wants the modem to work and do what she bought it for.

Because, really, the "suit" was not buying a modem. What the suit wants is information. What's being bought is access to that information.

Similarly, a suit does not buy a computer in the first place because he wants to run a computer. He wants to run a business or his part of it. The computer only helps him be more effective at it. What he calculates on that spreadsheet is more important than what spreadsheet he calculates it on.

He just wants to *use* the computer. If Apple and third-party programmers stay ahead of the pack, keep things simple, make life easier, there will be more and more suits using Macintoshes. And buying them.

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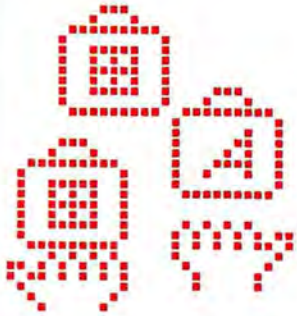
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by Frederic E. Davis

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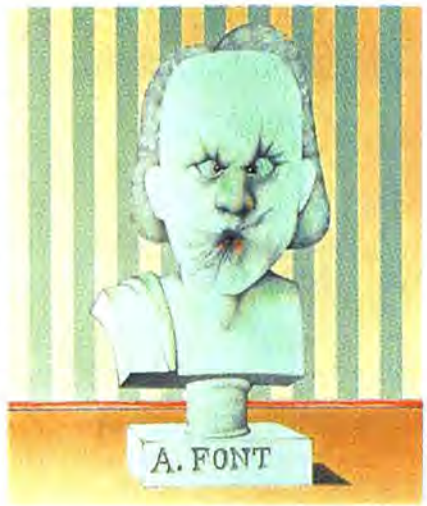
The field of desktop publishing is laden with jargon. Not only is there computer jargon to contend with, there's also publishing jargon. And to make matters worse, the fast-growing field of desktop publishing has not taken the time to learn the proper use of publishing terminology. The most flagrant misuse of a publishing term by desktop publishers is the word "font." Most computer users use the word "font" when they actually mean "typeface." For example, if you thought Helvetica was a font, you've been misled; Helvetica is actually a typeface.

In traditional publishing the terms typeface and font are quite different. The term typeface (or "face" for short) refers to the general design of a group of characters. Examples of typefaces are: Helvetica, Times, Palatino, Garamond, Zapf Chancery. Typefaces are created by artists who style the individual letters, numbers, punctuation and other elements into a group of characters with a unified design. The names of typefaces such as Helvetica are trademarks of companies for particular type designs; similar designs from other companies have different names. Rough equivalents to Helvetica are marketed by companies under names such as Swiss, Dutch or Sans Serif.

Furthermore, the term typestyle is used in traditional publishing to refer to a particular design of, or design enhancement to, the typeface, such as a bold typestyle or an italic typestyle. And font, that much misused word, refers strictly to an individual set of characters of a specific type size, typeface, and typestyle (that is, 12-point Helvetica Italic). Desktop publishers often use the word font to refer to the typeface (for example, Helvetica, Times, Palatino and so on). However, a font is only one size and one style; therefore 12-point Helvetica is a different font from 12-point Helvetica Italic, which in turn is a different font from 14-point Helvetica Italic, which is a different font from 18-point Helvetica Italic, and so forth.

MUTANTS FROM ANOTHER UNIVERSE

It's important to note that when you select BOLD or ITALIC typestyles from a menu in virtually all Macintosh applications you are not getting a true bold or italic typestyle. The Mac's typestyles come from the computer universe and they are not the same as true typestyles that come from the traditional publishing universe. A true typestyle has each letter, number and other character designed individually and separately from the main typeface that it is derived from, creating a new (albeit derivative) typeface. For example, Times Bold is a separate, although closely related, typeface derived from Times. However, if you want to use typestyles on the Macintosh in desktop publishing, you may find



that your typestyles are actually mutants from another universe. Here's an example: When you highlight a block of text in a Macintosh word-processing or page-layout program and select BOLD from a menu (or issue an equivalent command) you do not wind up with a true Times Bold, although that's what it looks like on the screen. What you get instead is a mathematically mutated version of Times Roman. The term Roman refers to the normal upright, not the bold or italic form of the typeface.

When you select typestyles such as bold, italic or outline on almost all Macintosh menus, the Macintosh mathematically mutates the normal typeface to create the derivative typestyles. Although these mutated typefaces look fine on the screen, fairly good on the ImageWriter printers and passable on the LaserWriters and other laser printers, they really look bad when printed using typesetting equipment. The problem stems from the fact that to create a typestyle such as bold, the same mathematical algorithm is applied to every character in every typeface to fatten the character up and make it appear bold. This "create a new typestyle on the fly" approach represents a nice bit of computer-trickery, but it often creates characters that are poorly formed and inaccurately spaced or improperly kerned, since the mutating algorithm doesn't always do a good job of stylizing the characters.

If you print a document with artificially bolded or italicized characters on a laser printer or typesetting machine and compare it to an equivalent document that uses true typestyles, you'll immediately see the difference between the two. In the true typestyles, each character is handcrafted by an artist to fit the particular style; bolds are created with broad pen strokes, italics are drawn at an angle and have special serifs. Also, even if the aesthetics of the mutated type doesn't bother you, the spacing of the characters is, in some cases, abysmal. The mutated letters are often either too far apart or too close together. The problems in character formation and spacing of artificial bold and italics are especially apparent when using large type sizes (over 14 points) in headlines and subheads.

In order to get true typestyles you need the actual stylized typefaces, not just artificially created mutations. For example, let's say you are printing a document in Times and want to use a true bold typestyle for subheads and a true italic typestyle for references to publications. To properly print your document you will need three typefaces, Times Roman, Times Bold and Times Italic. And each time you want to specify a particular typestyle you will have to change the actual typeface, not just select the style from a menu. Also, if

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you want to use the true typestyles for Times you should install the screen fonts for the Times Bold and Times Italic typefaces (in addition to PostScript's standard Times Roman) in your Mac's *System*.

Although some people might think I'm being a nitpicker for worrying about details in terminology, it's very important that desktop publishers and traditional publishers learn to speak the same language. Since traditional publishing came first and already has an established, well-defined terminology, desktop publishers should avoid reinventing the wheel and adhere to the accepted terminology used by traditional publishers. Both camps have a lot to learn from each other and consistent terminology will help the learning process proceed more quickly.

There's also, in an effort to create a low-end laser printer, the LaserWriter II SC, the LaserWriter with a lobotomy.

LASERWRITER GETS LOBOTOMY

In January Apple introduced three new laser printers in a major update to its LaserWriter family of printers known as the LaserWriter II series. The three printers in the family are the SC, NT and NTX. The LaserWriter II NT is the rough equivalent of the LaserWriter Plus. The NTX is the really fast souped-up printer that we all want but can't afford quite yet. And there's also, in an effort to create a low-end laser printer, the LaserWriter II SC, the LaserWriter with a lobotomy. It's not only a noble idea to create a low-cost printer, it's a very competitive one designed to get Apple a piece of the low-end laser printer market dominated by the HP LaserJet. Although the idea is great, the LaserWriter SC is not.

The biggest problem with the LaserWriter II SC is that it doesn't have PostScript. This means that you won't be able to use important desktop publishing software such as *Illustrator, FreeHand, Cricket Draw* and *Fontographer* with the LaserWriter II SC. And other desktop publishing programs will have major problems that you may stumble over: Most of the usual typefaces will be unavailable, encapsulated PostScript graphics imported into *PageMaker* from other applications won't print properly, and images digitized and saved in PostScript formats won't be able to be printed. PostScript is the leading computer graphics standard in use today and it is one of the major building blocks in desktop publishing. Because the LaserWriter II SC lacks PostScript capabilities it is not a suitable printer for most desktop publishing applications.

The LaserWriter II SC was not only given a lobotomy to remove all knowledge of PostScript, it was denuded of its network abilities by removing the AppleTalk capabilities found in all the other prior and current LaserWriter models. This means that it is meant to be a single-user printer. The multi-user AppleTalk network is one of the LaserWriter family's hallmarks, and I think it was a real mistake to take it away from the SC.

Luckily, all the new LaserWriter IIs are really the same box with different brains, and Apple offers an upgrade from the SC to the NT or NTX. So if you get fooled into buying an SC because it looks like the other LaserWriters, costs less or comes from Apple, you won't be totally stuck. For a somewhat immodest fee Apple will gladly take the barely useful circuit board containing the lame-brain of the SC out of the box and replace it with the satisfactory NT board or the really nice NTX board. But if you want my advice, skip the upgrade hassle and stay away from the SC. If you want a cheaper laser printer than the NT or NTX you don't have to get an SC; there are quite a few non-Apple PostScript printers available that offer both PostScript and AppleTalk.

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by Doug Clapp

I Have to Say This

He is one of the best-known columnists in this industry. He's written the column for years. Except he hasn't written it for years. It's ghostwritten. The ghost is a lesser-known freelance writer. The ghost gets half the monthly check for his duties. Everybody's happy.

The question on the registration card is: "The next Macintosh program should be:" The answer, according to one user: "Even harder to fit on one disk!" Another says: "The documentation should be like Apple's: Lousy!" And many more, users chaffing from their own honesty, write: "CHEAP!"

The season's put-down is "betaware." The editor of this magazine puts the label, unfairly, to *HyperCard*. Many software vendors, finding their bread and butter despised by Apple's newest surprise, publicly term *MultiFinder* beta. To those with short memories, it seems Microsoft started the trend with *Word* 3.0. But they didn't. Apple did, with *MacWrite*, the *Finder*, *MacDraw*.

Tear-off menus, à la *HyperCard*, for any application? Radius monitors offer tear-off menus as a software enticement. But privately, Apple's technical support staff says they're "Gross." "A fad." And they'll "break" when new System software comes out, they promise.

Many (most?) of the program "tips" given in magazines and newsletters are also in the manuals! They're in the manuals! Don't people read manuals? Or — a chilling thought — do the tip writers not have manuals? A more chilling thought: Are they writing for people who also don't have manuals? It's said piracy fuels the computer book industry. *Et tu*, magazines and newsletters?

Think Technologies releases a great *Lightspeed Pascal* compiler. But it could use improvements and doesn't work well with the newest *System* and *Finder*. Object-oriented programming is promised. In-line "smart" assembly code is promised. Much is promised. Then Symantec, cash-rich from "Q & A," an IBM PC data base, buys Living Videotext. Then Symantec buys Think. And the promised new *Lightspeed* compiler doesn't appear, and doesn't appear and you wonder if the talk at Think now is Apple Talk: stock talk, not shop talk.

The couple is young, newly married, nice people and new Macintosh owners. They love their Macintosh. They're excited. But they only have one disk drive. The next big family purchase will be a hard disk drive. "I think we'll get a 20,000 megabyte hard disk drive," they say. I tell 'em to get 40,000 megabytes. "Always get twice what you think you need," I say.

Ad agencies, it turns out, don't want to produce finished ads using a Macintosh and LaserWriter. Why? Because the ads look too good. And they can be produced too quickly. Ad agencies want, instead, only a "rough" to show clients. Then, when the client sees the finished ad, they'll have a greater appreciation for the effort involved. And a greater appreciation, one would guess, for the accompanying bill. It's a strange world.

The woman is a marketing executive for a software company. She's got an MBA. She talks about "the market." About "making projections." But when you talk about features, about the multitude of small, precise looks and actions that make up software, her eyes drift off. She's not an enthusiast. She's got a Macintosh, at work, and uses *Excel*. But she doesn't love software, you can tell. And by not loving it, she can't understand, truly, what makes one product "good" and another beneath scorn. Is this what happens when a company becomes large and successful? Is it hard to find people that love software? Were people at Lotus making projections about *Jazz* when they should have been screaming "Wait!"?

"What do you think of *4th Dimension*?" is the question from the distributor. I don't have any opinions, except about the packaging, which reminds me of those non-skid plastic mats you put in the bathtub. I wonder if Guy Kawasaki is learning humility at last, or should? I wonder if Ashton-Tate can do with packaging and advertising and marketing what Guy's trying to do with energy and personality and a better product? I think the answer is "Yes." Too bad.

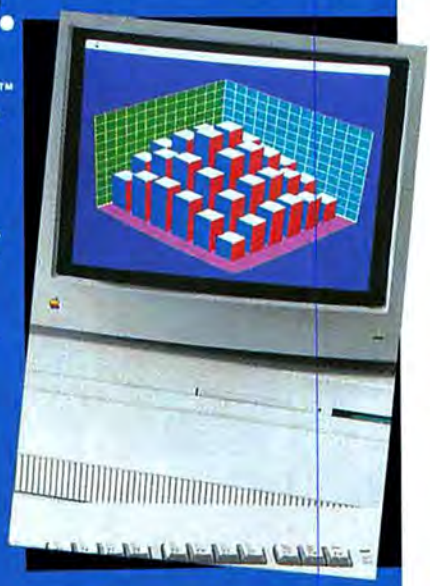
David Bunnell, some months back, writes a column in *Macworld* that, in essence, struts *Macworld* as the keeper of the flame of journalistic integrity. An exercise in pomposity. In the same issue, *HyperCard* is reviewed by — you'll never guess — Danny Goodman. Not surprisingly, Danny opines that *HyperCard* is a worthy program. I don't think Bill Atkinson could (or would) have produced such a glowing review. Probably just a coincidence.

File format madness sweeps developer community. PICT, TIFF, EPSF, RTF and more to come. Unfortunately, not all the new formats are thought out well, or even consistent in their implementation. EPSF (Encapsulated PostScript File), for example, seems invented by someone who never understood PICTs, the old dog of formats. You can do what you want in PICTs, you don't need EPSF. And TIFF formats aren't consistent. The best of the bunch is RTF, though not truly a graphics format. RTF is Microsoft's "Rich Text Format," but RTF seems in the doldrums. Is this getting complicated? The strange formats are the evil chil-



GARY HOVLAND

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dren of the marriage of QuickDraw and PostScript, each from different worlds, each carrying the sins of their parents. Is the solution to have computer and printer both speak QuickDraw or both speak PostScript? You think your LaserWriter is slow? Wait till you see "Display PostScript" on a screen. Where's incest when you need it?

EPSF, for example, seems invented by someone who never understood PICTs, the old dog of formats.

Within days of each other, *Insight* (all three volumes) and *In-House Accountant* both show up. I know nothing about accounting. But both programs seem fine pieces of work. You could run Exxon with *Insight.* The question is, do you want to run Exxon? If accounting is the thing you like, you'll love *Insight,* believe me. If you don't love accounting, you'll love *In-House Accountant.* The slogan for this one is "Accounting for people who'd rather not" and it seems true. A jewel of a program. A fine interface, simple and clean. A good help system. A readable manual. Lots of well-chosen Command-key equivalents. Many nice touches. My favorite: You can change the font and size in most windows. It's a joy to see Chicago. With *Insight,* at $595 a pop for each module, you work in Monaco. That's probably right; you can't run big companies in 12-point type.

Dump Dvorak letters keep appearing in *MacUser.* The stalwarts can't bear anti-Mac words, it seems. But they should know three things. If a columnist isn't controversial, s/he's not trying hard enough. John's the best columnist we have. And, of course, he writes great pro-Mac, anti-IBM columns for IBM mags. But, to the letterwriters' credit, it's harder to know than to write. So write they do, as do we.

The best-selling Macintosh software just got the ultimate upgrade.

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MacDraw® II. The professional standard for graphics made more professional with spectacular color, zooming, layering, plus more flexibility, precision and speed.

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And here we are, while the halls are still filled with the scent of new carpet, introducing more powerful versions of the most popular Macintosh® software of all time.

MacDraw, the desktop publishing standard for graphics, has been completely overhauled as MacDraw II. It's faster, more flexible and precise. With new features like zooming and layering. And now on the Macintosh II, your basic breathtaking color.

MacWrite, the most popular Macintosh word processor of all time, now includes a built-in spelling checker, a 100,000 word dictionary and an abundance of new optional keyboard commands.

MacPaint, the illustration program that's inspired nearly as many imitators as the Mona Lisa, now exhibits a larger work

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by Dan Cochran

Answers From the Mac Team

Got a Mac problem? Something that you'd like explained? Something you can't find the answer for anywhere else? Apple's Dan Cochran will answer your questions every month in this space. When the questions are too tough for him, he'll get the answers from other members of the Mac team. So ask what you need to know and get your answers straight from the source!

Send your questions to Dan care of MacUser, *Suite 250, 110 Marsh Drive, Foster City, CA 94404. Dan will read all of your questions, but, unfortunately, he may not be able to answer individual queries.*

GENLOCK AND VIDEO

Q. I recently acquired a Macintosh II and intend to use it to create animated business presentations — bar graphs filling up while you watch, individual counties on a map of Wisconsin being highlighted one-by-one and so on. It looks to me as if *VideoWorks II* will accomplish what I need.

However, I don't want to lug the Mac II with me whenever I need to give a presentation. Ideally, I'd like to transcribe the animated sequences onto videotape, where I can edit and add voice-overs to my heart's content. Then I can just send off the finished videotape instead of having to appear in person with a pick-up load of expensive hardware.

How do I persuade my VCR to accept RGB input? Or, preferably, how do I persuade the Macintosh to generate NTSC standard composite video output? Is there any way you know of to generate external video backgrounds on the computer, so that text and graphics appearing on the screen can be superimposed over pictures from other sources?

RICHARD RUSSELL
MADISON, WI

A. *Here's some information gathered by Apple Technical Communications that should steer you in the right direction.*

Genlock (generated locking) synchronizes a slave frame buffer to a master sync source, so that more than one video source can be merged into a single video signal. Genlock is used in the video industry for adding special effects, titles or graphics to TV images.

Genlock with the Macintosh II has much potential. Interactive videos can be made by using laser disk images in HyperCard *windows. Add a touch screen, and the user can operate* HyperCard *by simply touching images. Given the cost of commercial video character generators and video graphic workstations, the price of a Macintosh II with video graphic overlays seems very reasonable. Just as desktop publishing gave individuals the power once possessed only by print shops, personal computer video workstations may soon have the sophistication of professional studio editing equipment.*



The TV Producer (from Computer Friends, 14250 NW Science Park Drive, Portland, OR 97229; (503) 626-2291) is a video card that connects to the Macintosh II's video card. It can genlock to external video signals, allowing overlays of NTSC video with the Macintosh video. A desk accessory included with the product facilitates the overlaying.

The Macintosh II video card itself can supply RS170 video which is similar to NTSC in timing, but retains color signals on three separate lines. These lines can be mixed onto an RS170A NTSC signal with an NTSC color encoder device. While the Macintosh II video card can support RS170 video, Apple Computer doesn't as yet.

SuperMac Technologies (295 North Bernardo Ave., Mountain View, CA 94043; (415) 964-8884) also produces an NTSC video card. According to their literature, their Spectrum Color Graphics Card for the Macintosh II features, "stable, flicker-free NTSC-compatible genlock capability. In this mode, the graphics signal from the Spectrum board can be combined or overlaid with any standard video signal such as that from a TV, videotape recorder, or video disk source, and the output can be displayed on any standard NTSC monitor or projector."

ETHERTALK AND THE MAC OS?

Q. Our engineering lab is running on a 3Com Ethernet network under TCP/IP with a VAX host. We have recently purchased several Macintosh IIs which we primarily intend to use for documentation. Must we use A/UX while hooked into EtherTalk or will the Macintosh Operating System suffice?

RICHARD O'LEARY
PITTSBURGH, PA

A. *3Com has released a new Mac 3 driver for the Apple EtherTalk card which allows direct connectivity for the Macintosh II under the Macintosh OS and the 3Com 3Server using their implementation of the XNS protocol on Ethernet. The 3Com driver software will be unbundled from the 3Com hardware, allowing a purchaser of an Apple-labeled EtherTalk card to buy the software separately. You can get additional information on the Apple EtherTalk card from your dealer.*

WHITHER FILEVISION?

Q. Our department uses *FileVision* software for our infrastructural records system. While we find this program to be a great help in organizing our data on a computer, there is a problem when it comes to making hard copy.

We have found that bit-mapped graphics don't always line up with formula graphics (lines, circles,

ANDY MARTIN

text). The graphics do line up on the screen and when printed on an ImageWriter, but become misaligned when printed on a LaserWriter.

Telos Software formerly owned *FileVision,* but sold the rights to another company. Our department received an update notice regarding this, but unfortunately misplaced the document. We would greatly appreciate any information to correct this problem or the address of the company which currently publishes *FileVision.*

DANIEL J. KABARA
WAUWATOSA, WI

A. *First, make certain that you are using the latest version of the* LaserWriter driver *(Version 5.0) available from your dealer and included with the latest* System Software Update Package *(also Version 5.0). I had similar problems using* SuperPaint *(which features layered bit maps and objects) until I upgraded to the 5.0 LaserWriter driver.*

The new publisher for FileVision *is a company called Marvelin. I believe they are actually a spinoff of Telos Software. They also publish* Business FileVision. *You can reach them at: Marvelin, 3240 Ocean Park Blvd., Santa Monica, CA 90405-3395; (800) 368-3813 or (800) 554-2469.*

A/UX MULTIUSER

Q. Since the Macintosh II is such a powerful super microcomputer and Mac UNIX (A/UX) is available, can't the Macintosh II be used by multiple users? I'm thinking about starting an on-line data base on a Macintosh II. Is it feasible?

MAO RAN
RICHARDSON, TX

A. *Yes and no.*

A/UX includes standard serial drivers that will allow multiple terminals (or Macintosh computers running terminal emulation software) to be connected via the two built-in serial ports or add-on serial port expansion boards. With this configuration, multiple users could log-on to the Macintosh II as a UNIX server, do UNIX-type things (file management, editing, programming and so on) and run standard off-the-shelf UNIX multi-user software data base packages, accounting programs, word processors, whatever.

Most, if not all, of these products are character-based and as such, this configuration won't allow the user to completely benefit from the Macintosh graphics/mouse technology. Many existing Macintosh-specific programs will run under A/UX but to the best of my knowledge, none have been designed to allow multi-user capabilities while running under A/UX.

There is nothing to preclude a UNIX-based application from utilizing the Macintosh graphics and user-interface Toolbox calls and future

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third-party UNIX-based applications may very well incorporate Macintosh ease-of-use as well as multi-user capabilities.

ADB AND THE MAC PLUS

Q. Is there any possible way to hook up an Apple IIGS keyboard and mouse to a Macintosh Plus or 512? If not, why not?

JIM WHITE
LOS ALTOS, CA

A. *On the Macintosh SE, Macintosh II and Apple IIGS, the keyboard and mouse are supported by a new input bus: the Apple Desktop Bus (ADB). The ADB is controlled by an independent microprocessor accessed through the VIA chip and is supported by special mouse and keyboard drivers which pass user-generated input events to the Toolbox Event Manager. Apple IIGS, Macintosh SE and Macintosh II mice and keyboards are fully interchangeable.*

The 128K, 512K and Macintosh Plus keyboards and mice are interchangeable with each other but not with the ADB machines. They, too, incorporate their own independent 8021 microprocessor for key scanning and event detection, as well as specialized ROM and RAM circuitry for communication with the host machine.

I have read about a third-party hardware device that will allow non-ADB machines to properly accept ADB keyboards and mice. Its called the ADBridge and should be available by the time you read this from Olduvai, 7520 Red Rd., South Miami, FL 33143; (305) 665-4665. I expect the price will be between $125 and $150.

APPLE II/MAC COMPATIBILITY

Q. I have a Macintosh Plus and my wife recently acquired an Apple IIc. We're interested in sharing our software. I have several questions.

Are the Macintosh programs generally compatible for operation on the Apple IIc? If so, would it be possible for me to connect my Mac Plus external 3.5-inch drive to her Apple IIc, thereby enabling her to use some of my software? And, using the same set-up, could I make copies of her floppy disks onto 3.5-inch disks for the Macintosh?

If I were to buy a new mouse for my Macintosh Plus, is my present Mac Plus mouse compatible with the Apple IIc so that it could be used on her machine?

GILBERT S. MERRITT
DAMASCUS, PA

A. *The Macintosh family of computers and the Apple II family of computers are based on completely different microprocessor/hardware technologies (6502 versus 68000), completely different video display architectures and, with the exception of the Apple IIGS, completely different user-interface paradigms for software.*

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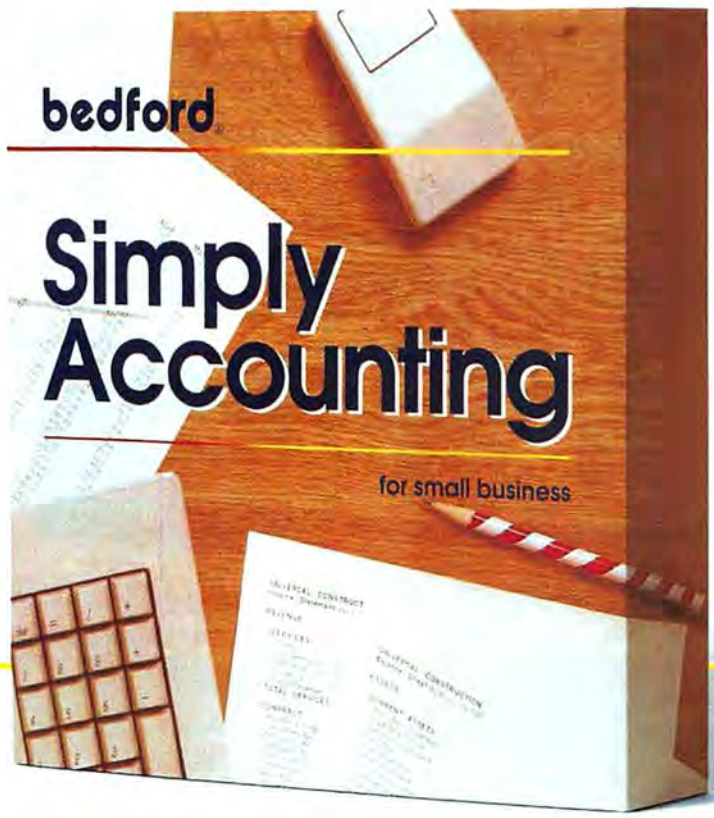
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Requirements
- Apple® Macintosh™ computer with one megabyte of memory, 800K on-line storage and 128K ROM

Standard Features
- Six fully integrated functions
- Reports can be displayed, printed or exported
- Not copy protected



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As such, even if you were to copy your 3.5-inch Macintosh software to IIc 5.25-inch disks, none of your Macintosh software would run on an Apple IIc and vice versa. And, I'm sorry to say, you can't connect your Macintosh Plus mouse to your Apple IIc.

You can, however, share data files between popular Apple IIc programs and Macintosh programs.

The most recent release of the Macintosh System Software Update *(Version 5.0 — available at your Apple dealer for $49), contains the Apple* File Exchange *program which allows you to convert your wife's IIc* AppleWorks *text files into* MacWrite *text files and vice versa. If you don't already have one, you'll need an Apple UniDisk 3.5-inch drive for your Apple IIc to provide a common media format for transferring the information back and forth between your machines. Your dealer should be able to supply you with the specific details of the software and hardware.*

THIS AND THAT

Q. I have several questions.

1. Some applications come with their own DAs, so can't you save memory by excluding any application DAs that are already in the *System* file?

2. What's the key combo to start up the *Font/DA Mover* with DAs?

3. Is it true that the Mac Plus has to have all RAM slots full to operate correctly? If so then I'll have to discard the four existing 256K SIMMs and put in all four 1-megabyte SIMMs.

4. Will this 4-megabyte Macintosh Plus need a fan?

LYNN FRANKEL
EDGEWATER, NJ

A. *And here are your answers:*

1. If an application includes its own desk accessory (identified as a DRVR resource in the application's resource file itself), and if this DA is redundant with one already included in your main System *file, you might save some memory (while you are running the application in question) by removing the redundant DRVR resource from your application. Be warned that some applications may be specifically looking for the DA in their own resource file and won't properly default to the* System *file if it can't be found. Try this at your own risk.*

2. You can start up Font/DA Mover *(version 3.6 is the version current at press time, but this technique works with older versions) with DAs by holding down the Option key as you launch the program.*

3. Apple Technical Communications has prepared the following information to answer your RAM configuration question, not only for the Mac Plus but also for the SE and II.

With the advent of larger SIMMs (single in-line memory modules), there are several ways to configure the memory on a Macintosh Plus, Macintosh SE or Macintosh II.

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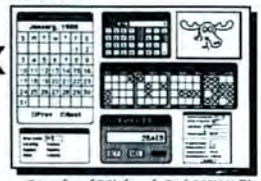
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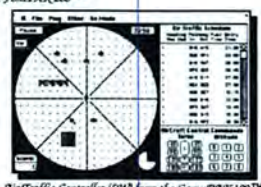
A sampling of fonts from the FontPAK 200 ™

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A sampling of DA's from the DeskPAK 200 ™

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The Macintosh Plus and Macintosh SE can be configured in five ways: 512K, 1M, 2M, 2.5M and 4M.

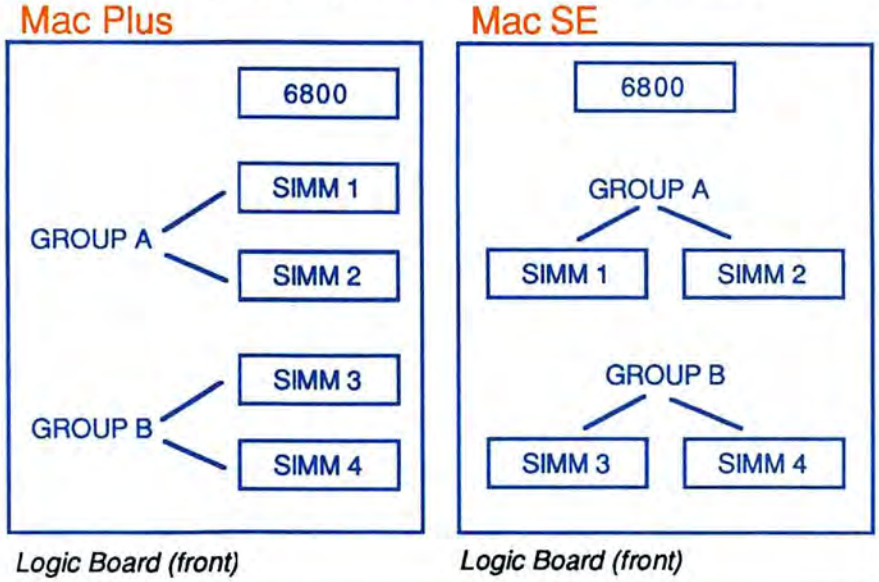
Memory expansion must follow strict guidelines that involve modification of the Macintosh logic board and correct placement of the SIMMs. Remember that opening up your Macintosh Plus or SE case and/or cutting or installing resistors will void your warranty.

Macintosh Plus and Macintosh SE logic boards each have four SIMM sockets, labeled SIMM 1 through SIMM 4. These sockets are paired in two groups of two sockets each. The illustration shows the layouts and possible SIMM positions. Group A comprises SIMM 1 and SIMM 2 (the two slots towards the rear of the logic board). Group B comprises SIMM 3 and SIMM 4 (the two slots towards the front of the logic board).

Both sockets in each pair must be configured identically. For example, both SIMM sockets 3 and 4 must either contain 256K or 1M SIMMs, or be empty.

The RAM density of the chips in Group A must be greater than or equal to the RAM density of the chips in Group B. For example, if Group A contains 256K SIMMs, Group B may be empty or contain 256K SIMMs, but not 1M SIMMs.

Some configurations require changes to the logic board. There are two resistors that tell the Macintosh



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important information about what kind of SIMMs are installed.

If you have only one row of SIMMs installed (say, Group A has 1M SIMMs installed and Group B is empty), then the resistor marked "ONE ROW" must be present; otherwise it should be cut or removed. (The Macintosh Plus and Macintosh SE are not shipped with this resistor installed.)

If your computer has 256K SIMMs in Group A, then the resistor marked "256K BIT" must be installed. If either or both groups have 1M SIMMs, then the resistor must be cut or removed. (The Macintosh Plus and Macintosh SE come with the resistor installed.)

There are currently five memory configurations for the Macintosh II: 1M, 2M, 4M, 5M and 8M.

More configurations — up to 128 megabytes — will be possible with the advent of higher density RAM.

Restrictions on placing SIMMs in the Macintosh II are similar to those for the Macintosh Plus and Macintosh SE: The SIMM sockets are divided into two groups, A and B, each containing four SIMM sockets. All SIMMs in either group must be of the same type, and the RAM chip density of the SIMMs in Group A must be greater than or equal to those in Group B. No resistors need to be cut to differentiate between the possible configurations.

Group A	256K	256K	1M	1M	1M
Group B	Empty	256K	Empty	256K	1M
Total Memory	1M	2M	4M	5M	8M

4. Under normal operating conditions, a 4-megabyte Macintosh Plus won't require a fan (although some users swear by them).

MULTIFINDER ARCHITECTURE

Q. Why was *MultiFinder* developed to use fixed-size memory partitions for applications? Computers such as Digital VAX/VMS systems dynamically allocate space to programs when needed. I would think this would work well with the Macintosh Memory Manager routines. Memory allocations from different applications could mesh together in the same "Application Heap". It would be the job of the Memory Manager routines to keep the allocations for each application separate. Of course this would break down if applications bypassed the Memory Manager either intentionally or unintentionally. However, applications that follow the programming rules described by *Inside Macintosh* would not have this problem (or would they?).

The logical extension of this would be to include and support the hardware memory management unit (MMU) that would keep one application from clobbering the memory of another application and allow for virtual memory page swapping. Using a dynamic allocation scheme would maximize memory utilization for Macintosh users without the

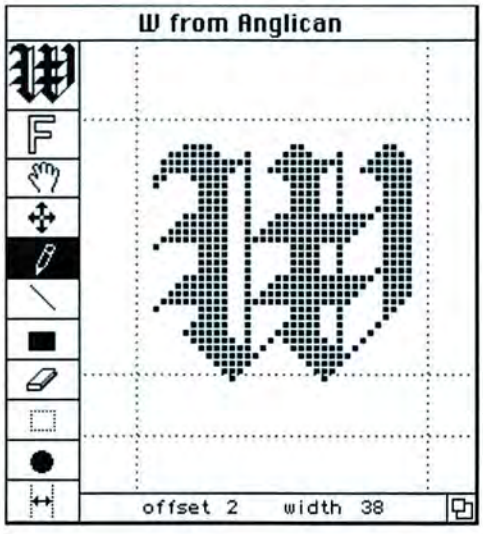
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MMU and at the same time provide the platform to support the MMU.
DALE KARSTEN
MANKATO, MN

A. *MultiFinder is Apple's first-generation multitasking environment. As such it had to be designed within the constraints of many of the existing memory management routines to ensure compatibility with existing applications. Much of what you suggest may well be desirable and even be implemented in future OS architectures — but given the current state of the ROM it's not feasible today.*

For instance, as soon as you allocate an application heap there's no scheme for resizing it. Applications today couldn't share the same application heap because the application memory blocks aren't tagged to any specific application. When an application terminates there's no way of knowing which blocks the application owned, and therefore, which blocks to release.

PFS/FILE

Q. The *PFS/File* program first came out in 1984 and shipped with *System* 2.0 and *Finder* 4.1. Its copy protection scheme checks for that. If you remove them and replace them with a *System* 3.2/*Finder* 5.3, the application comes up with a message box, "DataBase is broken... Use your backup disk immediately."

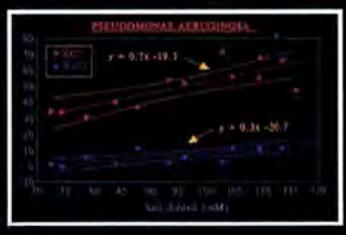
I have called the Technical Division of Software Publishing and asked them if *PFS/File* works with 128K ROMs, *System* 3.2 and *Finder* 5.3 so that I can upgrade my 512K Mac to a Plus. Their answer was to "emphatically not recommend you make any attempt to do this!"

The program was designed to work with the 64K ROM of the 128K and 512K Macs only. Any hard disk with *System* or *Finder* other than 2.0 and 4.1 will not work. Nor will the program work with any machine with a 128K or 256K ROM.

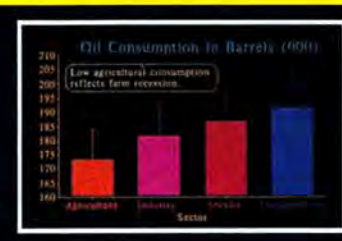
No upgrade is forthcoming. Version A.03 was the last release for that program. I have created a family genealogy file. *PFS/File* and *Report* are the only programs that print reports exactly as the family wants it. Is there anything I can do?
ROBERT O. JOHNSON
CONCORD, NH

A. *Thanks for sharing the benefits of your research. I do believe that our friends at Software Publishing will ultimately become a major player in the Macintosh software markets as they are in the PC and Apple II markets. In the meantime, I suggest you investigate other alternatives to* PFS/File. *It seems a shame to deprive yourself of the advantages of the Macintosh Plus because of your upgrade situation. Products such as* FileMaker Plus, Reflex Plus, 4th Dimension, *the* Helix *family and* Omnis III *allow a tremendous degree of flexibility (almost unlimited) in report formatting and printing.*

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MACLARGER ★★★



List Price: $449. Power R, 1606 Dexter Avenue North, Seattle, WA 98109 (206) 547-8000. Requires 512K+.

One of the most consistent complaints about the Macintosh is that the small 9-inch screen is hard on the eyes. MacLarger, a 12-inch external monitor, solves that problem by making What You See A Third More Than What You Get.

But is bigger better? Don't expect a higher resolution or more space to display a page. MacLarger puts out the same 512 X 342 pixels that the internal Mac monitor delivers. MacLarger just makes those pixels bigger — like looking through a magnifying glass. I'm typing now on a MacLarger screen and my usual 12-point Helvetica appears to be 16-point.

To hook up the MacLarger, you have to crack the Mac case and install a video output. (Available as a 512, Mac Plus or SE adapter. I used the Mac Plus version. This, of course, voids the warranty.) True to Power R's advertising claim, it takes only fifteen minutes. A tool to unscrew and open the case is included. The analog adapter clips in neatly between the logic board and the Mac's own video cable. You then pass an auxiliary composite video cable out through the Mac's security port and plug it into the MacLarger. The instructions to complete this task are not explicit, and if you've never been inside a Mac before, you'll probably end up looking dumbfounded for awhile. In the end, there's only one place in which the adapter fits, so you should be able to figure it out by the process of elimination, if nothing else.

The MacLarger is actually a modified Apple IIGS monochrome monitor and, as such, it matches the platinum case of the Apple line. The



bandwidth of 15 megahertz has been changed to 20 megahertz, and the 15.75 kilohertz scan rate has been upped to 22 kilohertz. Even though the monitor has been changed to accept the Mac's higher frequencies, it seems to have some adjustment problems when scanning. Defining large blocks of text in word processing documents makes the screen jump around. This is annoying at best.

The curvature of the screen is also readily apparent. The letters themselves seem to bend across the screen. And compared to the Mac's crisp contrast, the MacLarger looks dull. The one plus is that the monitor is visibly brighter than the Mac.

MacLarger's controls include a Vertical Hold, Vertical Size and Brightness at the back of the monitor and a Contrast control on the right side. Vertical Hold prevents the screen from flipping, and Vertical Size adjusts height of a window. The Contrast control affects the sharpness of characters or graphics.

The MacLarger is considered Class B, which is an FCC designation meaning that it has met strict codes for use in homes. Class B hardware doesn't emit as much interference as Class A, the industrial classification. Even so, the MacLarger manual says that interference with a disk drive is possible. Power R suggests you move the disk drive away from the monitor if this occurs.

Which brings me to the problem of positioning the monitor in relation to the Macintosh. The footprint of the MacLarger is roughly 12 inches by 12 inches. This means you'll have to put the Mac in back of or to the side of the external screen. Doing so stretches the keyboard cable to its limit and makes the internal disk drive less accessible. The result is less than stylish.

The MacLarger isn't large enough when it comes to height. It measures about 11 inches high, while a Mac Plus tops in at 13. Apple IIGS monitors normally sit on top of that computer's CPU. A monitor stand or last year's phone book corrects that problem easily. There is also a one-inch adjustable bar on the bottom of the monitor that allows you to raise the viewing angle.

I sometimes found myself peeking over the MacLarger to the Mac's crisper picture. This sort of stereo vision was novel and fun. It was like watching two TVs at the same time. You can hook up six MacLargers to one Mac — a good option for classroom instruction. In fact, I'm sure children will have a greater appreciation for the larger screen. The best application for the MacLarger may, in fact, be in the education market.

MacLarger reminds me of those magnifying sheets that you place



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over a page in a book to help people with poor vision read. If you really need it, then thank goodness someone makes it. — *BT*

LEARNWORD 3.0 ★★★½



List Price: $49.95 per module. Published by Personal Training Systems, PO Box 54240, San Jose, CA 95154. (408) 559-8635.

If a picture is worth a thousand words, is *Word* worth 270 minutes? That's not a Zen koan, it's the question posed by the *LearnWord 3.0* series of training tapes.

Even in the intuitive world of Mac software, a few power programs — like *Word* 3.0 — can be a little daunting. *Word* is easy to learn, but tough to master. Personal Training Systems has produced a series of training tapes designed to help you make full use of *Word*'s extensive capabilities. (Similar sets are available for *Excel*, *HyperCard* and other power programs.) Three *Word* units — beginning, intermediate and advanced — are available. Each unit includes a cassette tape, a disk with exercises and examples referred to on the tape and a Command Summary Card, which also serves as an outline of the training course. The cassettes consist of about 10 lessons; plan on spending about 90 minutes per tape, including breaks and pauses to work through the exercises.

The lessons are modular so you can break them into smaller chunks, repeat a lesson or two and generally set your own pace. The tape suggests you write down the cassette deck counter number for each lesson on the Command Summary Card for easy reference. (That only works, however, if you always use the same tape player; if you listen on a portable at work, a car stereo to review during rush hour and catch the rest on your home tape deck, the counter numbers won't be in synch.)

The tapes do an adequate job of conveying information, no question about that. They're structured, organized and reasonably thorough. The summaries at the end of each lesson are helpful, and point you to the right place to review any material that didn't sink in the first time. The overall production values and sound quality are good. The exercises on the disk are nicely coordinated with each lesson, and make you do everything at least once. They have enough done for you ahead of time that you won't get bogged down with typing when you're trying to learn. If you spend the time, pay attention and follow instructions, you'll learn how to use *Word*. That said, there's lots of room for improvement.



For starters, I knew I was going to have problems when my "guides" introduced themselves (Dave and Liz) at the beginning of the tape. From the way they talked, I wasn't sure what was supposed to come next: Were they going to show me the wine list? Or was it time to switch over to Bob with the AccuWeather forecast? It's not so much that Dave and Liz are dry as they are, well, plastic. Humorless. Patronizing. ("You can *stop* at any point," explain the voices on the cassette. Is it conceivable there are listeners who wouldn't have realized that?) The music between lessons is gratingly repetitive. There's not a single off-hand remark (or even a scripted remark delivered to sound off-hand). As conversationalists, Dave and Liz aren't much better than the manuals they aim to supplant.

That's not the only problem. Probably the worst is that they seem reluctant to use conventional Mac terminology. For example: "Drag the hollow box back up to the very top of the vertical column so that you are back to the top of the file." Ever heard of scroll bars and boxes, Dave and Liz? On the other hand, they're very fluent with Microsoft's jargon — misnomers and all. For example, what Microsoft calls the Command-Option-+ key combination (used to add font choices to menus, for example), literal-minded word processors (which, in my experience, they tend to be) would call Command-Option-=, since you don't hold the Shift key down. But Dave and Liz side with Microsoft.

Basically, Dave and Liz go by the book, which, in this case, is the *Word* manual. You won't hear any hints, tips, shortcuts, warnings or features that aren't the gospel according to Microsoft. Which isn't necessarily bad, but it does make for bland — and sometimes mindless — listening. They explain that "One nice feature of hidden text is that you can leave the text showing on your screen and still not print it on paper." That's not a "nice feature." That's part and parcel of what hidden text is for. But Dave and Liz leave you wondering what the *other* nice features of hidden text might be.

To its credit, the material is geared at teaching you to start out doing things the right way, not the quick and dirty way most of us pick up on our own. One of the first things you do is select FULL MENUS; the expectation is that you plan to become a power user. You're taught, for example, to adjust page breaks in Page Preview mode, not one at a time in regular mode.

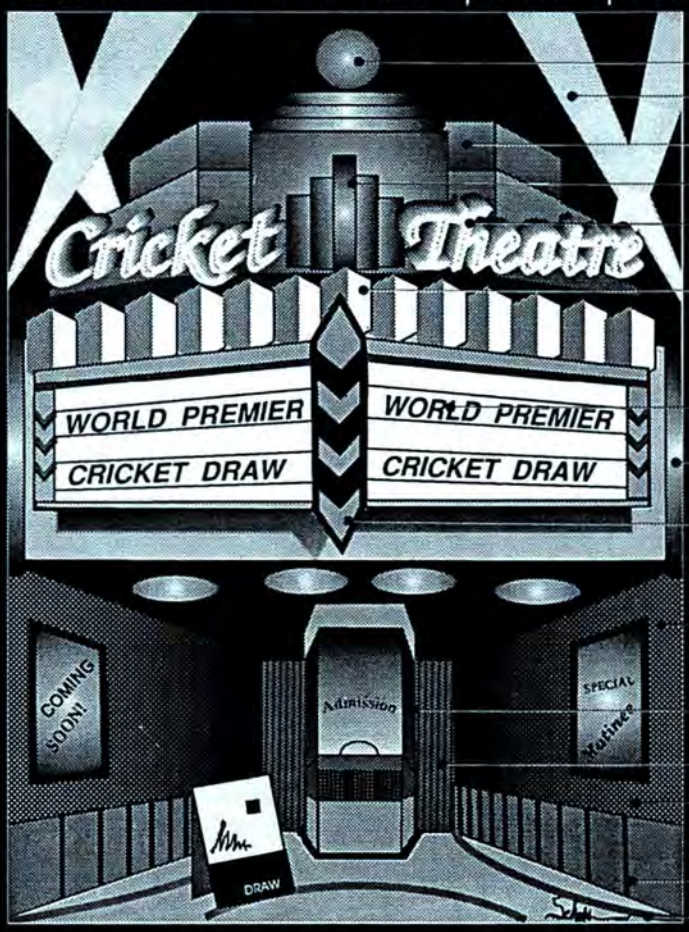
But there are some strange exceptions. To leave a dialog box, for example, the tape generally tells you to click OK. Odd, since you can usually just hit Enter or Return and leave your hands on the keyboard. (You could argue, I suppose, that clicking forces you to stop and think about what you're doing and is the safer technique.)

Don't get me wrong. *LearnWord 3.0* does a more than adequate job of explaining such oddities as the little triangles in the *Word* ruler, or esoter-

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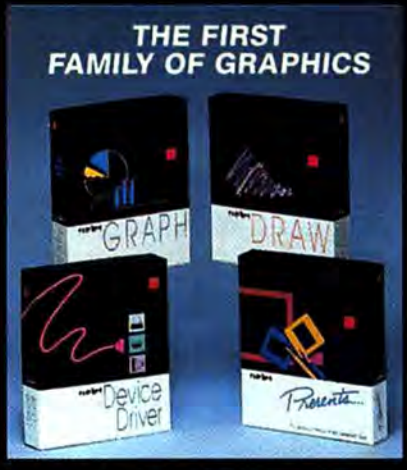
Cricket Draw's most universally acclaimed capability is its special effects generation. A quick glance at the example at left will give you a feeling for what can be accomplished with a little imagination and Cricket Draw. Graded Tones (fountains), Shading, Text on any path — all these effects and more are simple with Cricket Draw.

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ica such as creating complex mathematical formulas in *Word*. The disks provide well-constructed examples that could serve as templates for your own dual column or merged text files. I didn't even mind the pitch for the other tapes in the series that came at the end of each tape.

What my objections boil down to is that cassette tapes just aren't the best educational medium for the Mac. Apple's cassette guide to the Mac was useful when the Mac was first introduced. But now Apple is using the Mac itself as the educational medium in things like its *HyperCard* demo and Help stacks.

LearnWord 3.0 seems to be made for users who have *Word* thrust upon them, such as secretaries in a typing pool where a designated word processing software is used by one and all. Individual users will probably prefer the time-tested way of learning Mac applications: random experimentation. If the medium is the message, a low-tech medium isn't the best way to learn a high-power application. — *JZ*

HYPERTUTOR ★★★★½



List Price: $49.95. Published by Teligraphics, 936 Sir Francis Drake Boulevard, Suite R, Kentfield, CA 94904;(415) 454-7519. Requires 1M+ and *HyperCard*. Version 1.0.1 reviewed. Not copy protected.

HyperTutor should convince any holdouts in the education field that computers really can replace textbooks. This innovative stackware teaches you how to script in HyperTalk, *HyperCard*'s programming language. But it's more than just another reference work on individual cards. *HyperTutor* ranks as the best interactive education tool so far in the *HyperCard* environment.

Teachers like to break down the learning process into three parts: instruction, example and application. Mixing the first two phases together is easy, but applying what you've learned usually means leaving the classroom. *HyperTutor* brings it all together with a miniature Test Mac. This computer within a computer lets you script actual programs without leaving the card that holds the lesson.



Each card in *HyperTutor* is split into three instruction windows: the Frame window, the Syntax window and the Scripting Guide. The Frame window is where you get the basic information about a command. It contains only three lines of text so you have to scroll to read about a new function. The Syntax window shows the actual wording and spelling of a command. Clicking on an eye icon within the Syntax window reveals examples of the command as you would find them in a script.

To get at the Scripting Guide you click on a book icon in the upper right corner. This reveals more in-depth information about the lesson for intermediate and advanced programmers. The Scripting Guide window is hidden so beginners won't be confused by the more complex tips.

But it's the Test Mac that really makes this stack worthwhile. Clicking on the tiny Mac's power button reveals three more buttons: EDIT, SAVE and UNDO. To get at a script, you just click EDIT and a window opens up showing the current lesson's script. You can modify it, copy it and paste parts around. To see the script in action, just SAVE, then click on the body of the Mac.

The scripts you write with the Test Mac behave as if they were real scripts. They are in fact, but only to a point. The Test Mac holds only one script at one time. If you mess up, UNDO brings back the previous script up to the last SAVE, and if you really mess up there's a Reset button to the right of the Mac that brings the entire lesson back to its original content. Unfortunately this Reset button didn't work every time. Since the scripts you can write in the Test Mac are limited, *HyperTutor* comes with a stack called Test Address that you can practice on for more complex commands.

On top of all this, there is a Go panel that lets you maneuver around to ancillary *HyperCard* stacks. Click on an icon for a direct link to the Home card, an Index of *HyperTutor* lessons, the Help Stack and other stacks that come with *HyperTutor*, like a Graphics Help stack and the Test Address stack.

All this adds up to an exciting dynamic. But that wouldn't go anywhere without substance, and *HyperTutor* has plenty. The 41 lessons cover a lot of ground — from basics like handlers and pushing and popping cards to doMenus and importing text. Follow the tutorial and you'll have no problem scripting stacks.

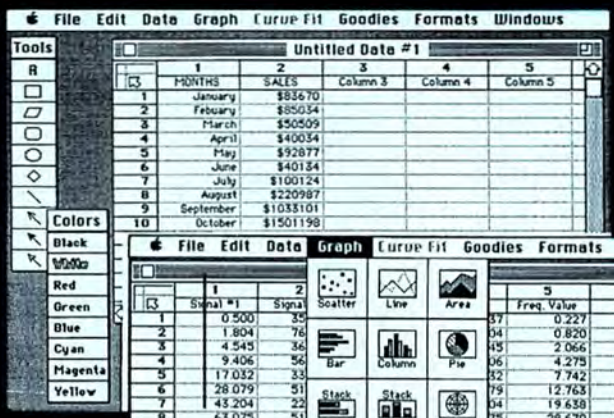
HyperTutor does have its idiosyncrasies. Whenever I accessed an application within the stack by using the OPEN command in the Message box, *HyperTutor* would crash when I returned to the stack. This is a known bug, and Teligraphics says it will be fixed in future versions. Also, there are times when it appears that the text in the Frame window has disappeared altogether. If you try to scroll up to get to the text, there is still blank space. Scrolling down and then up seems to reset it back to normal. There are also some grammatical errors, but nothing that obfuscates the meaning.

HyperTutor lies somewhere between the Help stack that comes with *HyperCard* and Danny Goodman's tome *The Complete HyperCard Handbook*. It's not as thick as the latter nor does it pack in as much information. Some people will still prefer hard copy. For those who will miss the actual feel of a book, *HyperTutor* includes the audible sound of a

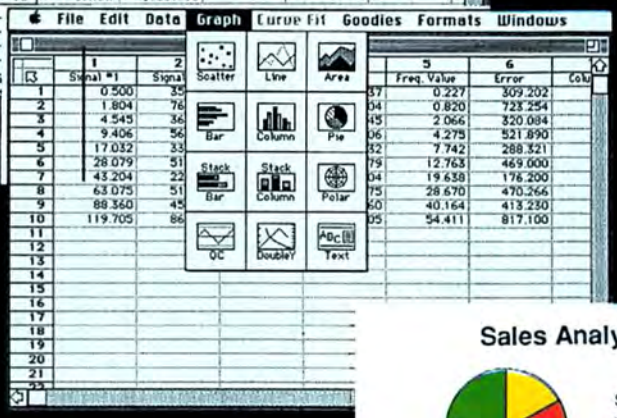
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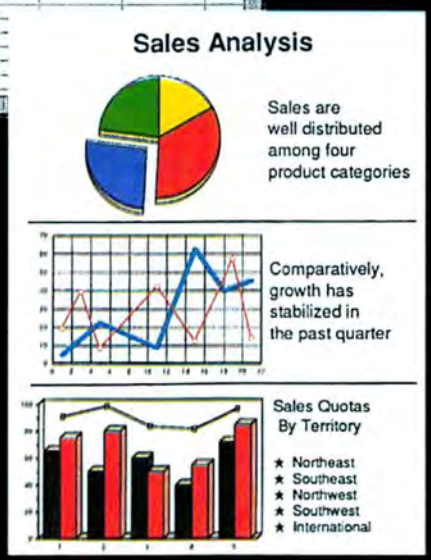


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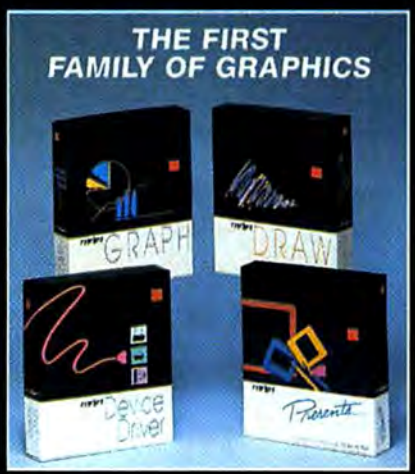
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When it comes to Macintosh graphics software, there's just one name to remember — Cricket Software. Your local dealer will be happy to introduce you to the entire family: Cricket Graph, Cricket Draw, Cricket Presents , and Cricket Device Drivers.

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page turning when you go to the next card — a nice touch. *HyperTutor* takes the static out of teaching the principles of HyperTalk. It is, in itself, a lesson in how best to create a hypertext document. — *BT*

FASTBACK FOR THE MACINTOSH $$$



List Price: $99.95. Published by Fifth Generation Systems, 1322 Bell Avenue, Suite 1A Tustin, CA 92680; (714) 259-0541. Requires 512K+. Not copy protected.

Hard disk backup software is the most maligned of all applications. It's terminally boring to use. But it's also among the most important of programs. If you've ever had a defective hard disk, accidentally trashed a file or perhaps knocked the drive off of a desk then you've learned the value of backing up the hard way.

FastBack for the Macintosh is a port from the IBM world, where it's considered one of the fastest hard disk backup utilities around. But *FastBack* is like the rabbit in the fairy tale "The Tortoise and the Hare." Sure, it's swifter than most other backup programs, but it can also beat itself by not being methodical enough.

FastBack gets its name by racing ahead and reading data from the hard disk while the disk drive is still writing information to a floppy. While other backup programs create a catalog on each disk, *FastBack* uses a master catalog on a separate disk. While this makes for quick backups, it also makes for a disorganized hard disk when you restore that data.

To do a backup you must first create the Catalog disk. When adding to an established backup, *FastBack* compares the files on the Catalog disk with what's on your hard disk in order to determine what's been changed and what is new. If you lose the Catalog disk, you can restore it by feeding all of your backup disks into the computer while *FastBack* recreates the list — a painfully slow process compared to the quickness with which it normally creates a catalog.

Once the Catalog is read, *FastBack* tells you how much in kilobytes there is to back up and how many disks it's going to take. You don't have to use formatted disks or assign names beforehand. Just pop the disk into the drive and *FastBack* does it for you on the fly. It also erases any information you might have had on those disks. There is no dialog box to warn you about losing data, so be careful.

FastBack is quick. No argument there. The advertising claims a megabyte a minute. My 15 megs actually took 22 minutes, but the dialog box at the completion of the backup informed me that 2 minutes and 45 seconds of that time were spent waiting for me to put disks in the drive. Why the program delivers this information eludes me. Is it so my boss can track my response time? Wouldn't having her watch me play a quick game of *Crystal Quest* accomplish the same thing? Or is it just some overzealous marketing gimmick to help *FastBack* live up to its name? It's the latter I suspect. Where *FastBack* stalls is in not being discretionary in what it backs up.

When you add to a backup, *FastBack* keeps on eating new disks. It doesn't go back to an old disk and replace a previous version of a file with its most current version. Also, if you've changed the organization of your hard disk, say moved a file from a "Current Accounts" folder to "Old Accounts," then the file gets backed up again even if you haven't changed the file in any way since the last backup. Not very efficient, but safe since you might have had two files with the same names.

However, if you do this sort of management enough (and I do), you end up with lots of identical files. When it comes time to restore, you'll probably run out of room before getting it all. At that point you're not quite sure what you missed since the disks were backed up chronologically. What you have to do is clean up your hard disk by trashing duplicate files and create a new catalog disk from the point you stopped backing up from — a pretty inelegant workaround.

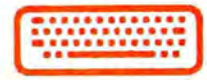


Some of the nice features on other Macintosh backup programs, like automatically excluding applications and the *System* from backup, are absent here. You have to do that manually by selecting or excluding files that are displayed hierarchically in their folders. If you back up more than 10 megabytes, looking through all of those folders for files that you want to leave out takes up a lot of time in itself.

FastBack isn't very Mac-ish in other ways too. Little things, like a close box in the upper left corner of windows, are missing. You can get by without it, but if you're used to having it, then you miss it when it's not there.

You'll probably save a lot of time using *FastBack*. Just hope you never have to restore since the resulting backup will be a mess. *FastBack* earns its name, but in some ways it's like running in circles. — *BT*

MAC-101 $$$$



List price: $169.95. DataDesk International, 7650 Haskell Avenue, Van Nuys, CA 91406. Requires 512K+ and keyboard connection cable. ADB and Mac 512/Plus versions available. Software not copy protected. ADB version reviewed.

Keyboards have always been problematic for the Mac. The original keyboards were criticized for many reasons, feel and the small number of keys being foremost. Now you can

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buy a "full-sized" keyboard for a Mac 512E or Plus. And you can save a few dollars on the price of the keyboard for your II or SE since you have to buy a keyboard for them separately. The keyboard is DataDesk International's MAC-101, which comes as the MAC-101/ADB for the SE and II. That's the unit reviewed here.

The keyboard is roughly the size of the Apple's Extended Keyboard, but lists for $59.05 less. It's covered by a 2-year warranty, and can be returned within 30 days for a full refund. The board is supplied with documentation, a software disk and a registration card. *However, there's no keyboard connector cable.* You're told to use the cable that was supplied with your original keyboard. This proved to be a problem — one of several I encountered — when setting up the new board.

I unplugged my old board, plugged the new board in and rebooted. Then I waited and waited, and waited — nothing. I rebooted again, this time the desktop appeared, but the mouse was dead. The third time I rebooted, the keyboard came alive as if possessed by evil demons. Empty folders were created at will, several files had their names changed and so on. All of this without me as much as touching the keyboard. The board has three indicator lights on the upper right side. (Caps Lock, Window Lock, Power ON) All three were lit. I jiggled the cable as it entered the keyboard and the first two went out and the Power On light remained lit.

I decided to reboot and try again. This time things seemed OK for a few seconds, but shortly after the desktop appeared I got a bomb with an ID 03. Time to call DataDesk. The company does not provide an 800 number. I was finally referred to customer support and the technician advised me to get a second cable. He said it could be that my cable didn't fit "exactly right." If that didn't work I was told I would have to return the board for repairs.

After a journey to my Apple dealer where I borrowed a new cable, I seemed to be in business. The system booted properly and the Mac recognized the Mac-101. For the price, and if the "fit" is that critical DataDesk should provide a cable with the board. Even Apple doesn't charge you extra for the keyboard cable. And if you're buying this in place of the Apple keyboard, you're out of luck without *any* cable. ADB cables are not readily available from Apple dealers.

There are good things about this keyboard, however; things that make it all worthwhile. The feel is outstanding. This is real typing, folks; you actually get a response from the keys. The keys are both well-shaped and placed; my fingers really fly. The board is laid out so well that I don't find myself hitting the wrong keys the way I do when using the new Apple boards.

There are 15 function keys (FKEYs) across the top, labeled F1 to F15. They're programmable using various combinations of Command, Option and Shift. The manual claims you can program up to 90 FKEYs. Below the last three function keys sit an additional six keys labeled: Paste, Home, Page Up, Cut, End and Page Down. These are also programmable in different combinations. Below this group sits the standard cursor key set, in an inverted "T" design. To the extreme right sits a full numeric keypad, with yet more programmable keys.

The keyboard comes with an interesting DA called *101-Keys*. This is a keyboard utility that allows you to program the nonstandard FKEYs of the Mac-101 so your Macintosh recognizes them. You can create a file for each program you run. The number of such files is unlimited, and they can be changed and modified easily.

However, this program was the source of my second problem. Installing the DA was not as easy as it sounded. The DA is not *MultiFinder* friendly and, in fact, would only run with *System* 4.1/*Finder* 5.5. It wouldn't work with *System* 4.2/*Finder* 6.0. The only other compatibility problem I noticed was with my favorite program of all time, *Pyro!* When using the *101-Keys* DA, you'll bomb after *Pyro!* activates. Note however, that CE Software's *QuicKeys* works fine.

DataDesk plans to offer, at a nominal charge, predefined files for many software packages. Excellent files are provided for *MacWrite* and *Word* 3.0. If you're a *Word* user, this keyboard is almost a necessity. It will allow you to take full advantage of that program's command language.

The Mac-101 keyboard is an excellent investment in your Macintosh. If you are buying a new Mac SE or II you can save $60 (enough to buy *Suitcase* and *Pyro!*, or maybe a keyboard cable from your Apple dealer). The feel of the keyboard alone is worth the price. — *Jack Ziegler*

MACTREE



List price: $69.95. Published by Software Research Technology, 22901 Mill Creek Drive, Laguna Hills, CA 92653. (714) 472-0474. Requires 512K+. Not copy protected.

MacTree is a program in search of a problem to solve. It could easily be the greatest *Finder* alternative, but it isn't. It could be the best file locator, but it isn't. In fact, what it does best isn't remarkably useful. *MacTree* displays your files in the form of a hierarchical tree. You can set the size of the tree from very readable (but you then have to scroll around a lot) to very tiny (where you see the form but can't read any of the text). This is one program where it really helps to have a big screen — it is much more impressive and useful on a 17- or 19-inch monitor.

There are a few problems. When you launch the program it puts up its own "fake" desktop (right down to its own nonstandard Trash icon). You might think, from the odd appearance, that it has switch-launched to its own *System*. It hasn't and it isn't clear why it has to do this "desk-

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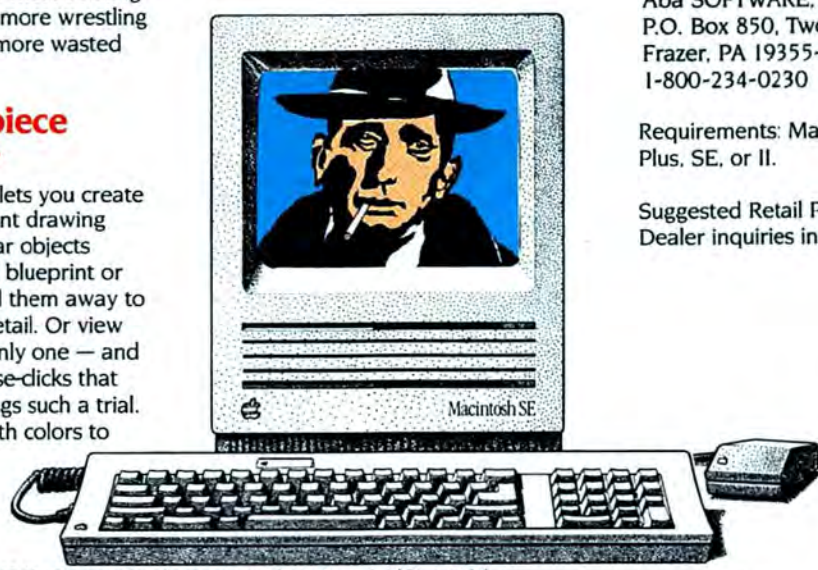
Only "Draw It Again, Sam" lets you create and use up to ten transparent drawing planes. You can group similar objects together, as an architectural blueprint or an anatomical drawing. Peel them away to reveal layer after layer of detail. Or view them all while working on only one — and avoid those accidental mouse-dicks that make doing detailed drawings such a trial. Use layers in conjunction with colors to produce spot color separations with ease or extend a single drawing into an animated series. You can even import a drawing and work over it or behind it without touching the original. Save or print the drawing layer-by-layer or as a whole. The possibilities are endless!

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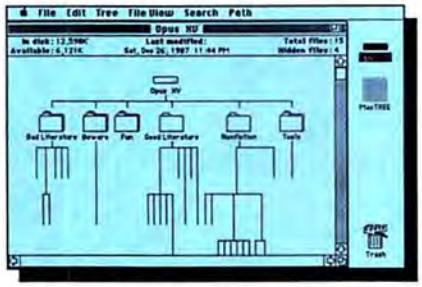
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top," which serves no purpose as far as I can see.

One problem with the basic display is the information provided at the right side of the information bar. This consists of some number of files and some number of hidden files. You might think that these numbers refer to the tree shown. They don't. They refer to the loose files on the top layer of the tree shown (trees don't have to start with root directories). Basically all that these numbers do is warn you to look for these files as they're not shown anywhere near the top of the tree, which is where they actually are in the disk's organization.

The manual and the disk don't agree on many things. It's possible to set the program up to coincide with the manual, but as this isn't a particularly intuitive program, you shouldn't have to do this at all.

The default settings are not what the manual indicates and the first time you open the program you get the tiniest, most unreadable image. And the manual doesn't go into changing the size until quite a bit later. By zooming in, you can get readable text, but parts of the display are truncated and there's no lateral scrolling for that material. It's just not visible.

If you're in the default Icon File View, it can be very difficult to decide which files are actually in which folders when you get deep into the tree. The default should be the List File View (change to that in Preferences).

Once everything is arranged to your liking, you'll find the program very fast. The search function is particularly good. It's just buried too far into the program. When examining folders (and trees, for that matter) the most important (and most used) command will be PREFERENCES. In the perverse design of this program, PREFERENCES is placed all the way at the bottom of the File menu, right above QUIT.

One thing that *MacTree* shines at is transferring to other applications. Just double-click on any application or document (if the necessary application is present) and you can go directly to it. Unfortunately, quitting an application doesn't take you back to *MacTree* so that you can find and launch another program or document.

It's nice to see how my disk is organized and, as the manual suggests, seeing the chaos can encourage me to organize the disk more effectively. But that's not much for $69.95. I want to like this program — the basic idea is good, even great. However nice the concept though, the execution is a letdown. — *SB*

BEYOND ZORK ★★★★½

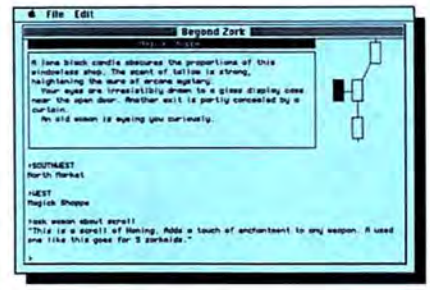


List Price: $49.95. Published by Infocom, 125 CambridgePark Dr., Cambridge, MA 02140, (617) 492-6000. Not copy protected.

From the mind of Brian Moriarty, one of Infocom's creative designers, comes the latest addition to the Zorkian canon. Unmistakably a sequel to the million-selling *Zork* series, *Beyond Zork* offers plenty of exasperating puzzles, ferocious grues and humorous asides. These Infocom hallmarks are satisfyingly familiar, yet this isn't just another one of your typical text adventures: *Beyond Zork* incorporates many standard role-playing components as well as several new program features.

In an age when magic fails and the Enchanters' Guild lies in ruin, the monster-ravaged kingdom of Quendor cries out for a savior. You, a lowly peasant, are nominated. Your task is to find the fabled Coconut of Quendor, the repository of magic.

As in more orthodox role-playing games such as *Ultima,* you begin the quest by allocating a limited number of attribute points to your alter ego. Your player character assumes a unique identity as you juggle varying amounts of endurance, strength, dexterity, intelligence, compassion and luck (alternatively, you may select among six preset characters).



Loosed upon the countryside with nothing but a single zorkmid and a pack, you must explore villages, collect treasures, solve puzzles and bash monsters. Of note is a certain pacifist slant toward confrontations in this game. Although you certainly must defeat attacking monsters, you cannot kill them; injured creatures usually slink away into the mist. There are scrolls, wands and amulets to discover, and shops to visit for potions, armor and weapons. As your character survives encounters and unravels mysteries, the attribute levels increase. And as the attribute levels increase, you're better able to overcome opponents and solve problems.

Despite its role-playing aspects, *Beyond Zork* remains very much a model text adventure with finely detailed place descriptions and numerous complex puzzles. As Moriarty said (in an electronic on-line conference about *Beyond Zork*): "*Zork* is really a very nebulous environment. Almost anything is kosher so long as it conforms to a handful of loose guidelines and includes a grue or two." Devotees of *Ultima*-style games who don't otherwise enjoy Infocom's style of interactive fiction will not be converted by *Beyond Zork;* character development plays a minor role in this adventure.

Several useful new features and commands are available in *Beyond Zork:* on-screen mapping of the player's current location; window dis-

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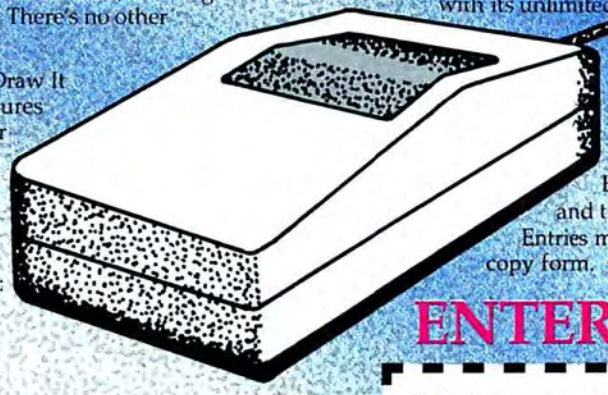


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All artwork must be produced with a registered copy of "Draw It Again, Sam" software. Entries are limited to one per person, per category. All artwork becomes the sole property of Aba Software, Inc. and contestants give up all rights and claims in connection with its unlimited use. All finished artwork must be received by May 7, 1988. **Entries will be reviewed by a panel of judges made up of industry leaders and artists.** A complete list of winners' names will be available from Aba Software, Inc. Winners will be notified in writing by June 15, 1988. Employees and Associates of Aba Software, Inc. and their families are not eligible for this contest. Entries must be submitted on disk and in hard copy form.

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plays of place descriptions, inventory and attribute levels (depicted via a bar chart); ten player-definable function keys for frequently used command strings; movement by keyboard, keypad or mouse; an UNDO command that permits erasure of one previous move; and setup options that allow the player to customize screen display and output.

The *Beyond Zork* package includes the game disk, a Macintosh-specific reference card, a clearly written instruction manual, a humorous and nicely illustrated 'lore and legends' booklet (with information about dust bunnies, lucksuckers, dornbeasts and chocolate truffles) and a foldout map of the Southland of Quendor. A separate disk is required for saving games.

Due to the number of difficult puzzles and the random nature of their solutions, *Beyond Zork* must be considered an expert-level game. However, familiarity with the earlier *Zorks* is not required of those looking for a challenging and unique adventure. — *Patricia Fitzgibbons*

EASY CHECKS



List price: $59.95. Published by PAR Software, PO Box 1089, Vancouver, WA 98666. (206) 694-1539. Requires 512K+. Not copy protected. Version 1.01 reviewed.

The concept is enticing, the design is good. But the end results disappoint. The Mac should be an ideal check register. Numerous templates have been developed for data bases and *HyperCard*. None have really been satisfying. Maybe it's just that check registers are one of those areas where computers get in the way more than they help.

Easy Checks puts your check register (or credit card records or any other simple financial account) into an easy-to-use desk accessory. Your first look shows an intuitive, easy-to-use, logically laid out program. Data is entered into up to five fields and added to the currently open file at the click of a button or the press of a key. The field sizes are adequate for all but the biggest businesses. Even the restrictions on the Payee and Memo fields of 35 characters each are reasonable.



It's hard to make mistakes. If you attempt a forbidden action the program lets you know in no uncertain terms. And the program is forgiving. Accidentally enter anything but numbers (and a decimal point) in the Amount field and the program filters out everything but the numbers.

Moving around is simple. There's a Command-key equivalent for everything. You can point and click or simply type. The Command-key equivalents are easily learned (they're logical extensions of the operations), and the program is accurate (very useful in a check register program).

The good things stop here, unfortunately. Printing works well enough — if you have an ImageWriter. *Easy Checks* can't print to a LaserWriter. The manual says it doesn't work with AppleTalk. That does leave hope (albeit slight) for users of GCC's PLP and Apple's LaserWriter SC, both of which use the SCSI port.

While you can print checks, you must first go through a Byzantine procedure to create Formats. Each file can hold up to 31 of these Formats. You create them by a trial-and-error process.

Start by using a sample form, then measure (in inches) certain dimensions. Multiply your readings by a multiplier (there are several different multipliers) that's specified in the the extensive (45-page) manual. Put the resulting values in a format grid. Select the built-in ImageWriter font

desired (you have a choice of small, medium and large sizes — roughly 9 to 12 points). Try a sample to see how close you came. Fix it and try again. It took me five tries to print my checks acceptably. That's too much effort. And the results were pedestrian. I realize that typographic elegance is not a requirement when printing checks, but I'd have appreciated a few more options.

You can print either single checks or continuous feed checks. Continuous feed works better, but generally requires a special check order on your part. My small, personal-sized checks often failed to feed properly through my original model ImageWriter. You need to spend considerable time and effort aligning these small pieces of paper if you expect them to print properly.

The reporting function is adequate. You can easily search and winnow your data on a large variety of criteria. However, reports must be printed to the ImageWriter. They can't be saved as a disk file — a very serious flaw. There's no way to export these files to any other application for further massaging. And the printed reports require a Format of their own, requiring you to generate yet another trial-and-error form. Again you're restricted to the fonts and sizes built in. The inability to use other fonts and sizes is even more troublesome here than it is in check printing.

The ability to reconcile your accounts is nice, but it certainly isn't "automatic" as the packaging implies. You must edit each entry. That's often a simple matter of selecting it and pressing a Command-key equivalent, but it's still time consuming.

PAR offers two support plans. If you elect what they call the Extended Warranty, you get a year of unlimited telephone support (no 800 number though). The Extended Warranty costs $15, but includes a $5 rebate coupon for any other PAR product. The Standard (read "free") Warranty is good for only 90 days and offers support by mail only. This is the sort of policy I'd expect to find on a big pricey program, not a small, relatively low-priced program like this.

Finally, the manual tells you to use a back-up copy of the program, but never mentions how important it is to regularly back up your data files. The net balance is that you can do everything this program does (with the exception of the reports) faster and easier in your checkbook. If you have trouble keeping your checkbook up to date now, *Easy Checks* will not change the situation and may even exacerbate it, as you'll have to make notes about your checks and remember to enter them into the computer. The old ways are often still the best ways. — *SB*

HANDWRITING ANALYST

★★★★½



List Price: $49.95.
Published by Ciasa, 2017 Cedar Street, Berkeley, CA 94709, (415) 644-2771.
Version 1.0 reviewed.
Not copy protected.

I always figured that handwriting analysis worked on the fortune cookie principle: Keep the conclusion so vague that everyone can find some way to apply it to his situation. On the other hand, it's mystifying how strongly handwriting runs in some families, especially since most of us learn to write in school, not at home. Clearly there are more powerful factors influencing the way we write than just family resemblances in bone structure.

But in the modern world of word processing, who actually writes? So even if the underpinnings and theory of trait stroke graphology (as it's called) are valid, how could the analysis of an unused skill be meaningful? And how could a complete novice perform a meaningful analysis of something as complex and subtle as handwriting? Armed with these questions, I was intrigued by (but skeptical about) *Handwriting Analyst,* a program that asks you questions about your writing (or somebody else's) and turns your responses into a profile of the writer's personality.



I didn't get any answer to the how questions, but color me converted! The reports based on analyzing samples of my own and others' writing were right on target. And the conclusions weren't just vague truisms, but were highly specific, like "You have a tendency to talk out loud to yourself."

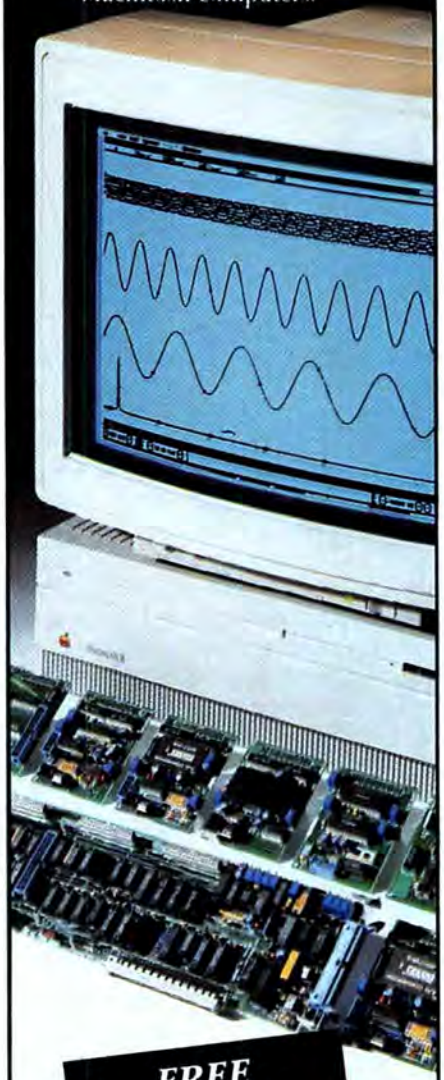
Handwriting Analyst is fairly low-tech. It consists of a series of multiple-choice questions about the writing sample in question. It's up to the user to do the actual analysis of the writing. But don't worry if you're not up on your T-cross variations. The manual provides adequate explanations and examples for each question, and help is available at every screen. (One quibble: The Help screens are text only — they don't provide any graphics of representative writing examples.)

You respond to the questions by either clicking a button or by typing the number corresponding to the right answer. The writing sample can be text, a signature or both. The questions include general items about the slant, height and style of the writing, and specific items about specific letters. You'll want several examples of certain letters and letter combinations, so the longer the writing sample is, the better the results will be.

The full battery of questions takes 15 to 30 minutes for a novice to work through. Since a signature only includes part of the alphabet, many questions can be skipped when analyzing signatures only. The manual suggests that "analyzing only a signature is an excellent way to use this program for party fun" since your signature reflects how you want to be perceived (or so goes the theory);

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other writing reflects aspects of our inner personalities that might be inappropriate for parties. (That depends on the type of party, I guess.)

Once you've answered all the questions, sit back and generate either a brief or a full analysis. The report is generated in about a minute, and can be displayed on screen, printed or saved to disk. The underlying mechanics behind the report is a straightforward one-for-one correspondence between certain responses and particular traits listed in the report. For example, closing your Y-loops means you're good at managing money.

Strict trait stroke graphologists, like strict Freudians, maintain that this kind of analysis is never wrong. If the analysis says you're outgoing and you say you're an introvert, graphologists would say the analysis is right, but you're screwed up worse than you thought. Some graphologists also maintain that writing is the cause and personality is the effect, not vice versa. So if you're having money problems, the graphotherapy cure would be to make a conscious effort to close your Y-loops.

Occasionally *Handwriting Analyst* produces seemingly contradictory statements. A future release may remedy this by clarifying some of the wording in the library of trait descriptions used to build the reports.

The manual provides a brief history of graphology, a glossary of graphology terms, a bibliography, a list of resources and the signatures of various celebrities for whom analyses are also included. Isaac Asimov, you discover, "is very logical and excels in rational problem-solving." The Ronald Reagan analysis alone is worth the price of admission. ("Ronald," the report observes, "is neither overly thrifty nor overly generous.")

My own attempts at analyzing the celebrity signatures generated reports similar to those created by expert graphologists. (Lee Iacocca, we both found, "appears to be extremely self-confident" and "has high aspirations.") So even though I wasn't always sure I understood all the questions asked by *Handwriting Analyst*, the results showed that the process was more or less idiot-proof.

Although none of its flaws are serious, the manual could be better. For example, many of the examples of supposedly different writing styles look like they were all forged by the



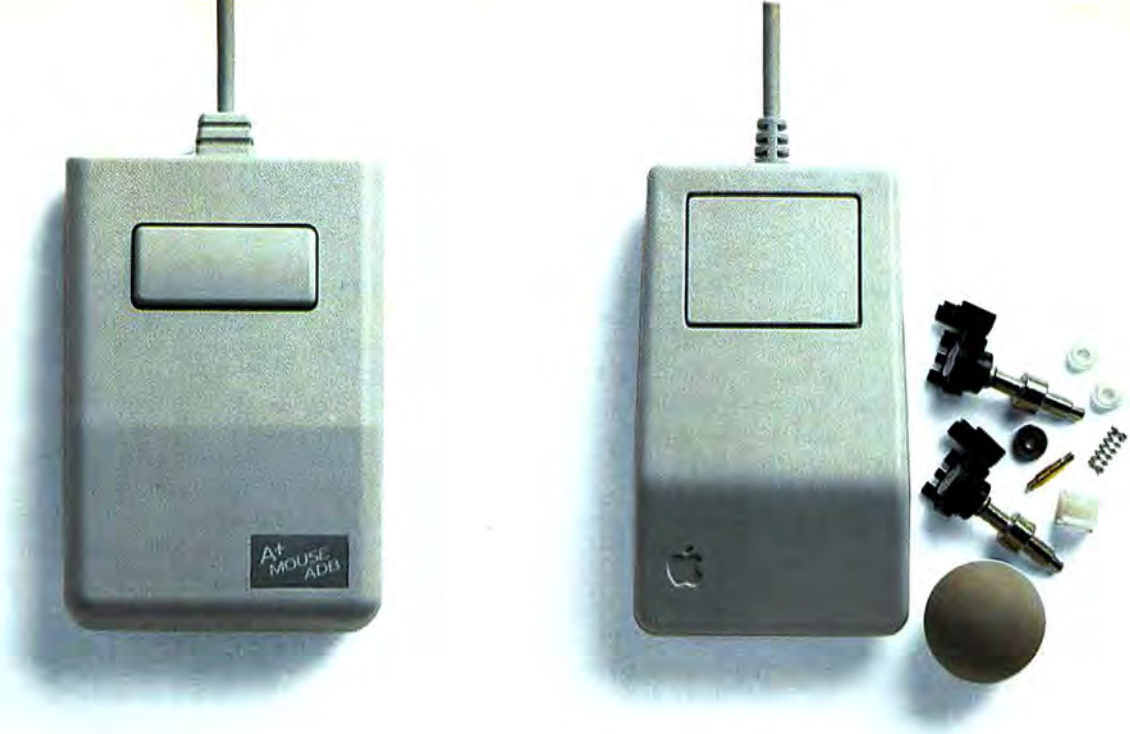
same writer. A few well-placed arrows or other highlights might help the novice understand what exactly to look for in a few spots where the terminology gets confusing. The writing style (its content, that is) is also often rather idiosyncratic. But you should be able to get the idea of what to look for in each question.

Another minor problem: The program only stores the analyses for 20 writers. Since the program isn't copy protected, you can always copy the program to create 20 more storage slots, but this is an awkward way of doing things. It would be much easier if there was a Save As data format that you could use to save the analyses separately from the program.

Technical support is informal. Ciasa, the publisher, is primarily in the career planning business, not the software business, but they'll be happy to talk to you and answer your questions. You shouldn't have any problems though; the mechanics of the program are simple, despite the occasional non-standard radio button or two.

The program's novelty value is limited — like an adventure game that you can only play once. But if you're in a situation where you need to make quick assessments of strangers (if you're debating whether to hire someone, if you're in a singles bar, etc.), *Handwriting Analyst* is a surprisingly useful tool.

Learning to analyze writing is half the fun. But if you're using this for a serious application, an automatic



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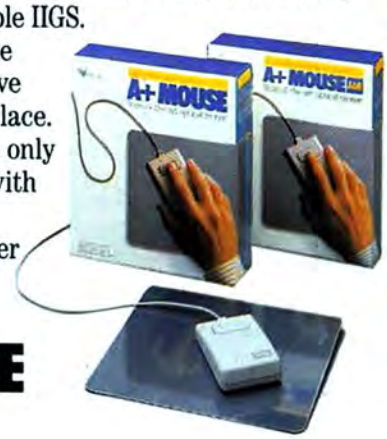
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analysis of digitized writing would be nice. Imagine the possibilities if *Handwriting Analyst* was hooked up to a handwriting input device (like Personal Writer). The combination could act as a real-time therapist as you went about your daily business. ("Your aggression is showing...why are your loops so tight today? Try to relax....") — *JZ*

SENTINEL ★★★★



List Price: $149.95. Published by SuperMac, 295 N. Bernardo Avenue, Mountain View, CA 94043. (415) 964-8884. Not copy protected.

The information on the hard disks of corporate America is often the most valuable — and least protected — asset these companies possess. For psychological security, simple and inexpensive utilities are available to password protect your Mac, while leaving the structure of the files on your hard disk unchanged. That might be enough if you have some level of trust in your colleagues and if they're not terribly sophisticated at Mac hacking. Passwords will keep out roving eyes and can check a snooper's temptation to peek at your files when you're away. But they don't do much to stop the serious hacker, because the file itself is still there in its original form.

For cloak-and-dagger level security, you need an encryption program that provides a level of security beyond merely slapping a password on your files. *Sentinel* does this very nicely, very quickly and very easily. However, unless you're already reasonably savvy about security, you might not be happy with its simplistic approach to passwords.

Encrypting a file means scrambling the data itself. Even if the wrong eyes get a look at encrypted files, all they'll see is gibberish. When you're not working with a particular file, an encrypted version of it resides on your hard disk. *Sentinel* can also be used with floppies, which is useful if you have to transport sensitive data and don't trust the courier.

First, you'll need to tell *Sentinel* which files you want encrypted. (*Sentinel* works only on documents, not applications, so it won't prevent software piracy, just breeches of security.) *Sentinel* asks for a password, and has you verify it. Type slowly and make sure you enter what you think you're entering. The display only shows an empty box for each character you type. If you type in (and verify) the wrong password — not as hard to do as you might think if, for example, you have your hands shifted over a key on the keyboard — you'll permanently lose access to your own file (unless you can recreate your mistake). When the file is encrypted, a lock and chain is superimposed over the icon for that file. (Another cute touch is the slamming safe sound effects when you lock a file. You can disable the sound effects if you prefer efficiency to cuteness.)

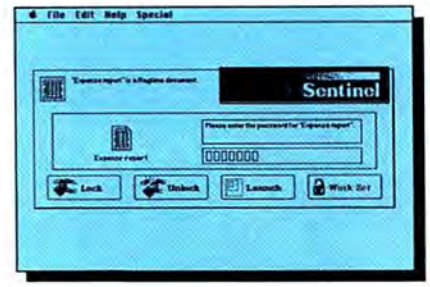
When you need to work on the file, just click on the modified icon. A *Sentinel* dialog box appears asking for the password for that file. After you enter the correct password, *Sentinel* decrypts the file. Once the files are "unlocked," you can open and close them without providing passwords.

It would be nice if *Sentinel* reminded you which files were left unlocked before you shut down, but it doesn't. However, it does have some nice features that let you group together frequently used documents into special "Sentinel Sets" which can be locked and unlocked with a single password.

The program also keeps track of all the documents you've unlocked in the current work session, and lets you create a temporary "Work Set" that you can lock and unlock with a new password. This is handy if you have to leave your Mac for a few minutes; you can secure any unlocked files without locking each file individually, even if the files don't belong to a predefined Sentinel Set. In general, the user interface is intuitive and cleanly designed.

There are two encryption algorithms available. The "SuperCrypt" algorithm is fast (it encrypts a 100K document in about 5 seconds) and, is presumably, reasonably hard to crack.

For hard-core encrypting, however, an implementation of the DES algorithm from the National Bureau of Standards is also available. DES is much slower to encrypt (about 90



seconds per 100K) and decrypt, but it provides a deeper level of encryption and is *de rigueur* if you're involved in John le Carrésque activities (such as classified government work). *Sentinel*'s DES algorithm is purportedly the fastest on the market. But if you've never heard of DES — if you're just interested in basic encryption — SuperCrypt is probably all you need, and a lot faster.

Sentinel does its encryption job well, but it doesn't offer any help with what's often the weakest link in the security chain: choosing passwords judiciously and keeping them secret. No matter how clever the encryption algorithm is, you're still only a password away from decryption. Statistically speaking, with a 20-character password, the number of guesses an intruder would have to make before stumbling onto the right password is enough to keep a Cray humming away for what statisticians call "a heck of a long time."

But most people use mnemonic passwords, like words and names that have some meaning for them. The generally useful manual suggests that you select passwords that are "easy to remember but hard to guess."

The on-line help does warn against using obvious passwords, like your

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name, telephone number or other obvious passwords, like "Joshua" from the movie *WarGames*. But if you've used *any* mnemonic password, a clever filecracker armed with a dossier on the details of your personal life could cut the number of possible passwords down from astronomical to merely vast. If the filecracker can assume your password is a word, a name, a date or even just an English-like nonsense word, the amount of time needed to crack the password might be reduced from millennia to months, and — for any security environment serious enough to warrant the use of DES encryption — months is not enough (ouch!). And, even worse, most people keep hard-copy lists of passwords on the premises.

At the very least, *Sentinel* should have some kind of a reporting mechanism to let you know that someone's been taking blind stabs at your passwords. And it should have a lockout penalty for random guessing at passwords. For example, if you got the password wrong more than, say, three times in a row, it could impose a 1-minute delay before your next try, a minor nuisance for an authorized user who made a legitimate mistake, but enough to significantly slow down a would-be filecracker trying to cycle through a list of a few thousand possible passwords. (For top secret files, some users might even prefer an option in which the file is destroyed after more than a few incorrect tries at the password.)

The next release of *Sentinel* is expected to include some kind of lockout feature. It will also let you lock (and hide) folders, and will include modular encryption algorithms that will let you substitute an in-house encryption technique for DES or SuperCrypt.

The program isn't cheap, but compared to the value of your data, it's worth it. (You can also get *Sentinel* as a freebie — along with several other SuperMac programs — with the purchase of a SuperMac hard disk.) If you (and your co-workers) can choose and use passwords wisely, *Sentinel* can do the rest. — *JZ*



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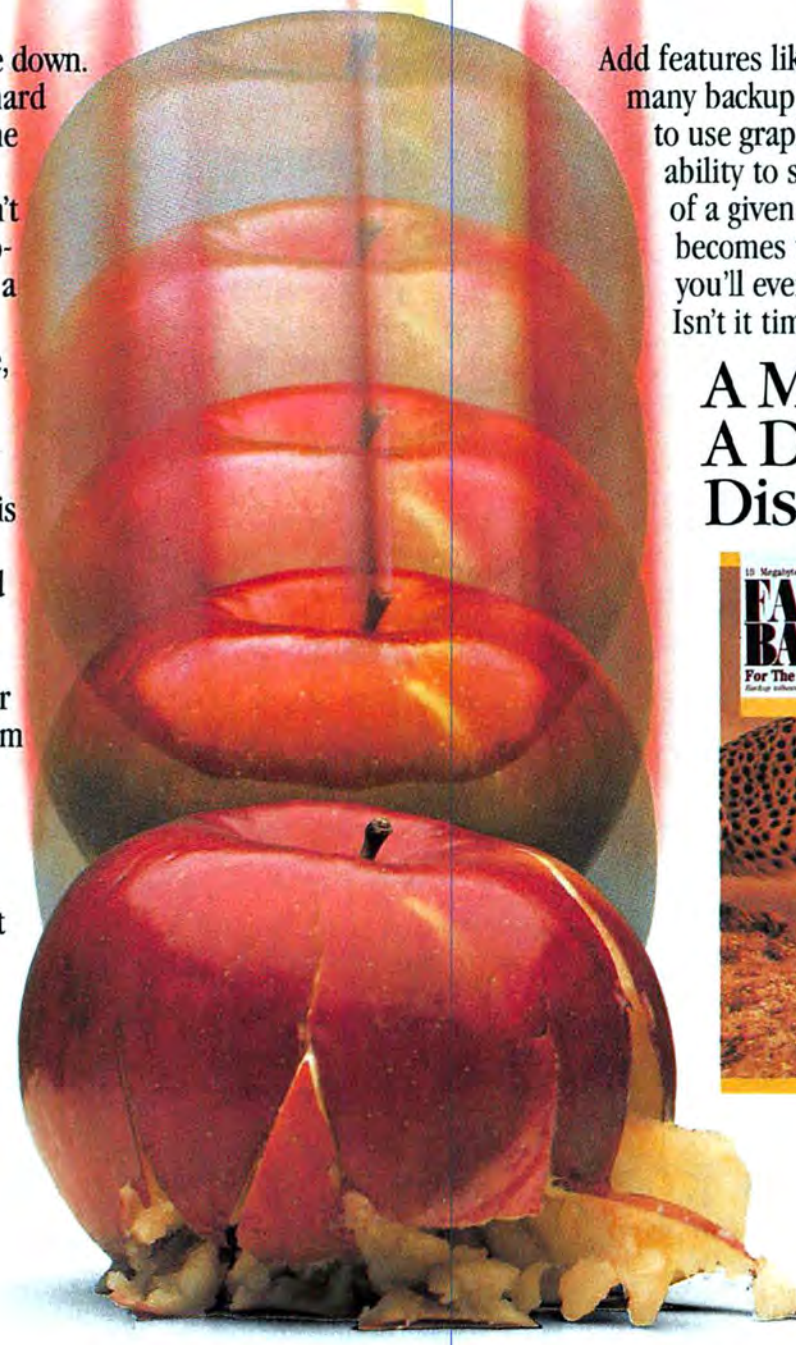
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Double Helix or Nothing
Part 1

This combined review-tutorial not only tells all about Double Helix II but also shows you how to get the most out of it.

DOUBLE HELIX II IS THE 4TH GENERATION of the first true relational data base for the Mac. Odesta, its publisher, has listened to its users, and *Double Helix II* incorporates much of the wish list for this powerful system. You can now automatically update fields in files, or relations as *Helix* calls them, other than at the source of entry. It's also capable of having "inert" fields — fields that do not store data but are temporary receptacles for use in calculations or posting to other files. With these new options *Helix* overcomes its most glaring past deficiencies for constructing truly powerful and complex data bases. While *Double Helix II* is not perfect, it now takes a back seat to no other Mac data base currently on the market and comes out a winner when power, flexibility and ease of use are considered.

Double Helix II, 4th Dimension, Reflex Plus, Omnis 3 Plus and *dBase Mac* are all powerful data base development systems. A look at their features list, while informative, doesn't provide enough information to appraise the development capabilities and environment. Speed aside, the critical difference between these products lie in their approach to data base design, in the techniques required to accomplish specific tasks and in the detail, for therein lies their strengths and weaknesses. Furthermore, the Mac community runs the gamut from the neophyte who wants to get the job done with as little learning time as possible, to those with experience in data base development and programming for whom procedural languages are no hassle. So we're going to provide you with enough detail in these articles to really evaluate *Helix* or any relational data base as to whether it fits your needs.

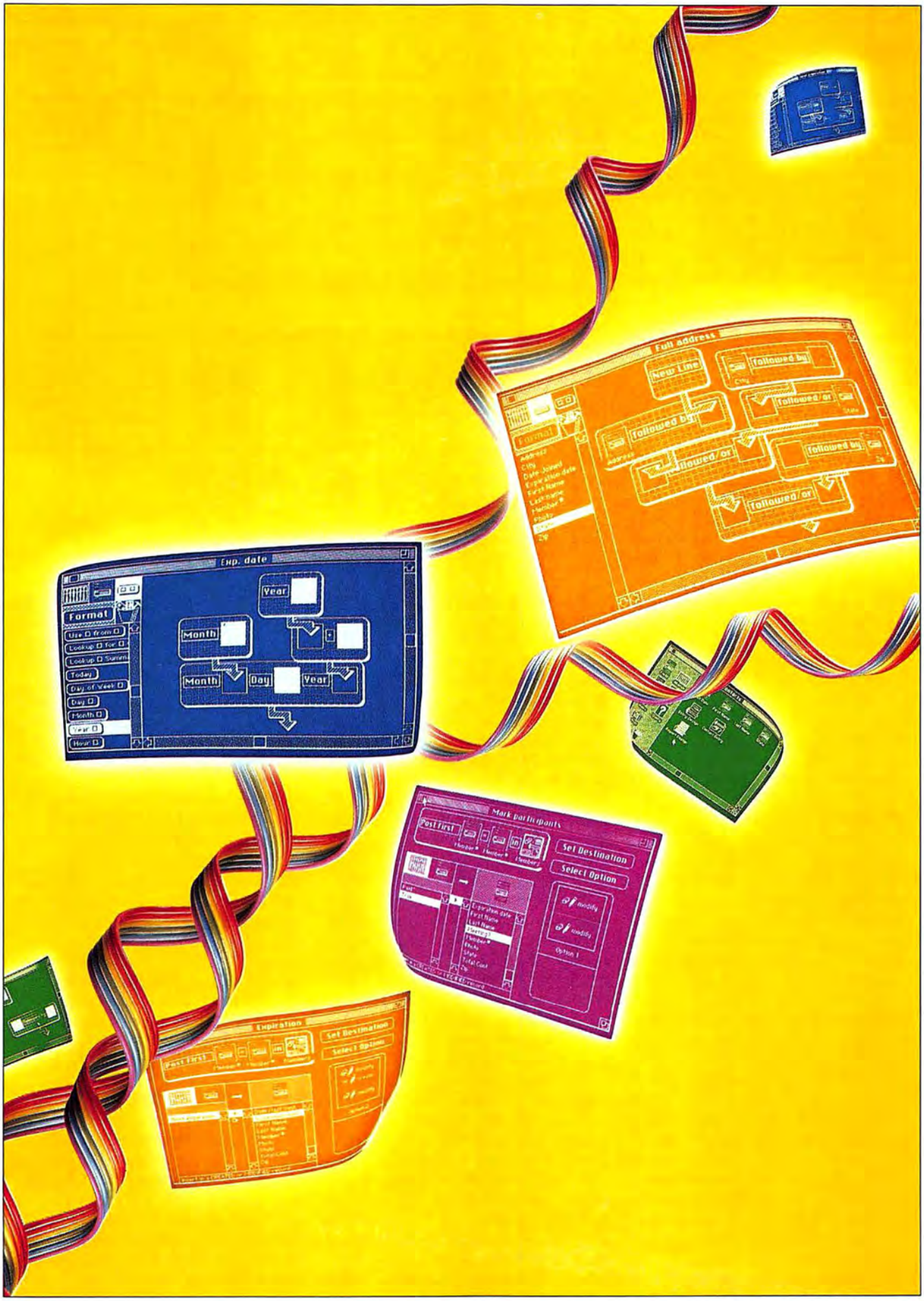
Double Helix II is available in both single user and multiuser versions, plus a runtime version for customized standalone system development. It's also *MultiFinder* friendly. The multiuser version runs under its own network which is independent and does not require *AppleShare, TOPS* or any other network system. The multiuser version is in fact just *Double Helix II* running under the control of a host program called *Multiuser Helix* with the visitors running a program called *Network Helix*. Thus, applications developed under *Double Helix II* need no modifications to run in the multiuser environment. *4th Dimension* is a multiuser system and *Omnis 3 Plus* is available in a multiuser version; *Reflex Plus* and *dBase Mac* do not currently support a multiuser environment.

DATA BASE DESIGN MEETS HELIX

The most distinctive characteristics of *Helix* are its use of a visual metaphor to present the abstract concepts of data base design, and the fact that it is *completely* nonprocedural.

Everything in *Helix* is visual and is based on object-oriented icons which are used to define fields, forms, calculations, views, selection criteria and posting operations (up-

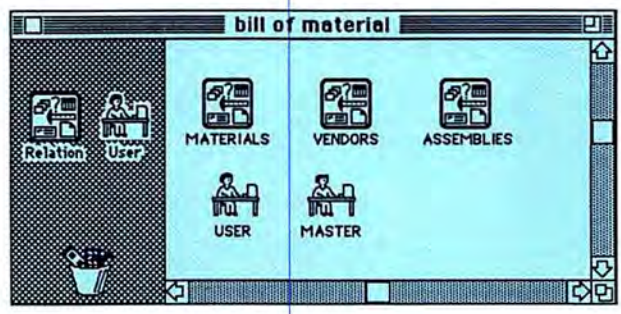
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Double Helix or Nothing: Part 1

dating data in a file other than the source of entry). These icons are manipulated in a logical building-block fashion to construct a data base.

Since *Helix* is nonprocedural there is no programming or procedural language to learn as there is with *Omnis 3, 4th Dimension* and *dBase Mac* (although *Reflex Plus* is nonprocedural, it lacks the ability to update data fields not directly shown on a layout or in a linked file from data entered in the linking file). Why is this significant? A procedure is like a set of directions to get from point A to point B. If someone gives you directions to get from your house to their house and you mix up the sequence of turns, you won't get there: The sequence is critical. It's the procedural aspect of building a data base application with other systems that is the source of most problems for people without programming experience. *Helix* integrates the various icons representing different forms, calculations, posting and so on to produce the desired result in a method that is transparent to the user. By eliminating procedures and letting you concentrate on result-oriented icons, Odesta has created a system that is easy to grasp so that beginners can start constructing systems in relatively short order.



The basis of a *Helix* data base is a system of files called a Collection. The individual files are called Relations.



A Relation can contain any number of fields, abacuses, templates and so on by dragging one of the icons on the left into the main window. Dragging an item to the Wastebasket at lower left will delete it.

DATA BASE STRUCTURE

A *Helix* system of data files is called a Collection, and the individual data files or relations of data within the system are called Relations. For example, a basic bill of material system or Collection would have files or data relations for Vendors, Materials and Assemblies. This could be expanded into a more comprehensive inventory control system by adding files for Purchase Orders and Usage Records.

Helix has two modes of operation: Full Mode and Custom Mode. Each Collection can have custom menus and password security for individuals which are active in Custom Mode. The use of custom menus keeps all but the system administrator or developer out of the insides, and the system looks like a standalone package.

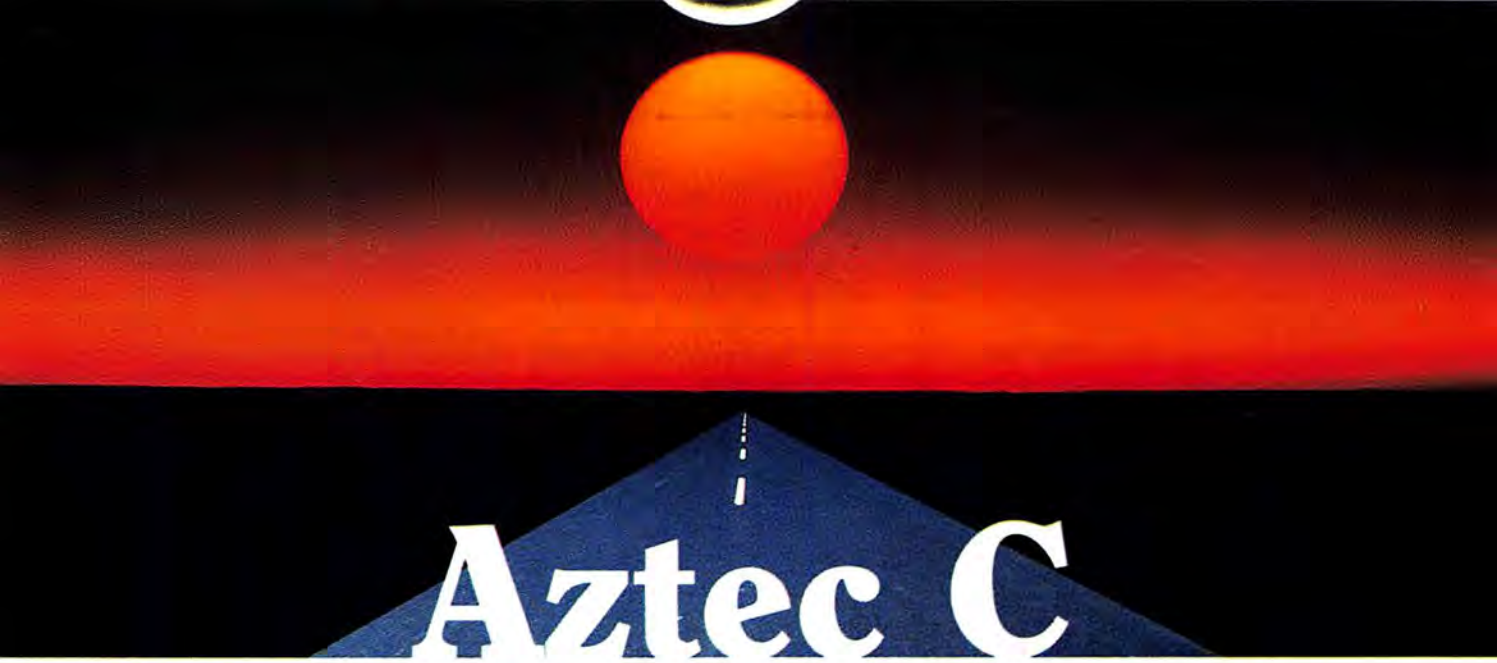
To add a new data relation to a collection, simply select the Relation icon from the palette on the left side and drag it into the main window. To get inside a relation to define, see and work with the guts of it, double-click on the relation's icon. To discard something, drag it into the wastebasket. If you want to duplicate the structure of a relation, you can do it by selecting it and using the DUPLICATE function on the Edit menu. If you select two relations *at the same time* (Shift-click) that have interrelationships between them — for example, customers and invoices — and perform a DUPLICATE, you get two new structures interrelated to each other — suppliers and bills, for example. Because of this duplicating feature of *Helix,* it becomes simple to develop a complex system that has multiple sets of linked data relations. Create and test one set first, then duplicate it as a base for the other(s).

Within a data relation there are data Fields, which obviously define the data in the relations, Abacus icons which define calculations, Templates which are designs for input/output screens and reports, Indexes which are index files that can be built on any field, combinations of fields or calculations (as long as that calculation is not a summary type calculation), Query icons which define search criteria, Posting icons which define the data to be posted and the conditions of posting to records or fields not shown on the screen (or template) in use (This is new to *Double Helix II*) and finally the View icon which specifies a combination of a template, query, index and posting to produce the desired result.

When you first open a new relation, the main work area, which appears to the right of the tool palette, is blank. Icons representing the seven types of objects (fields, abacuses and so on) are on the left in the tool palette, along with a waste basket for discarding defined icons if you no longer need them. To define the object drag it from the tool palette into the main window area, name it as you wish by typing over the object name and double-click it to open the object.

FIELD TYPES AND DATA VALIDATION

Helix permits data fields composed of Text, Numbers, Dates, Flags or Pictures. Text fields can be up to 32,500 characters in length. SANE (not a 68881, if present) is used for all number crunching, resulting in numeric calculations with an 18 to 19 digit extended floating point accuracy; the user has the op-



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tion of specifying the number of decimal points or expressing the number as a percentage. The inclusion of commas and/or a currency symbol is also an option. There are four formatting options for dates, including time. You do not have to specify field length as part of a specification; the data length is controlled through the size of the data rectangle used on input templates and can be changed at any time merely by changing the size of the input area. After you drag a field icon into the window and name it, double-click to get the field type definition box, select the data type and click on Format to choose one of the format options available.

A welcome enhancement to *Double Helix II* is the addition of *inert fields*. An inert field is one where the entered data is not stored in the record, but can be used for calculation purposes or posting to a record in a relation other than the one in which it is entered. This opens up endless possibilities to the creative data base designer. For example, you can design a single form data entry screen for entering a multiple item order and have the order header information (such as customer number, ship date and so on) posted to the Order Header Relation and the item details posted to an Order Items Relation along with posted adjustments to an Inventory Relation.

Validation can be done on data fields through one of two methods. The first is the availability of 12 simple criteria, such as greater than a specified value, equal to a specified value and so on. The value(s) are specified by the user as well as the error message that occurs when the data fails the validation test. If the standard criteria are not adequate, the users then build their own validation equations using calculation abacuses. For example, you can create validation criteria for a field that is a function of the entered value of a previously entered field. You can even do this for a subsequently entered field. In the latter case, the error message will not occur until you try to enter the record, as opposed to when the data for the field itself is entered. *Helix* informs the user of a failed validation with an audible beep; the user then presses COMMAND-Y or selects WHY from the Apple menu to see the relevant error message. *Helix* won't permit entry of a record if any field violates its validation criteria. Validated fields can be shaded or not on each screen layout.

THE ALL POWERFUL ABACUS TILES

The Abacus Icon that is used to define calculations is one of the most powerful features of *Helix*. *Helix* surpasses all other Mac data bases in its support of derived fields — fields computed from the values of entered data. *4th Dimension* doesn't support derived fields except by a procedural program, and only *Helix* supports indexes on derived fields.

To define a calculation in *Helix,* drag an Abacus icon from the left

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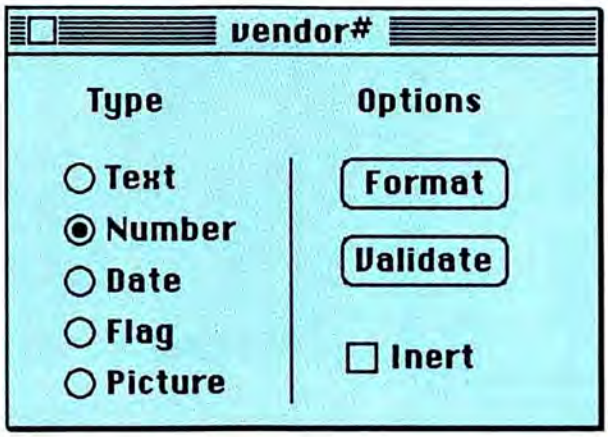
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hand tool palette into the main window area of the relation and open it by double-clicking. The top of the palette on the left of the opened abacus window contains three toggles or switches for selecting a list of the available fields, abacuses or calculation functions. When the calculation function switch is selected, a list of 101 "tiles" appears on the left, each one of which represents a numeric calculation or function.

The tiles range from simply multiplying two numbers and If/Then/Else functions to the LOOKUP tile which permits you to look up a value in another relation or file based on a linking criteria using values and/or calculations in the two relations. More than one tile can be used in a single calculation by connecting them in building block fashion. Use of these tiles is most easily explained through an example.

Suppose we wanted to calculate the cost extension of a purchase order item. This value is the product of the quantity times the unit cost. The first step is to scroll down the tile list until the multiplication tile is found, then select and drag it into the main window area.



The Field Type Specification window lets you specify the type of data to be entered into a field. You can also set criteria for validation by clicking on the Validate button.

Each black hole in the calculation tile must be filled in with a data field icon. These can be selected from either entered data fields, which can be listed by selecting the field icon in the top middle of the palette, or by other calculation results, the list of which is obtained by selecting the abacus icon on the top left. We want to multiply quantity times unit cost, both of which are entered data fields, so this option is selected. Next, scroll down the list of fields until you find the first one, "quantity," then select and drag it into the appropriate black hole in the calculation tile. The last step, if the results are to be displayed, is to double-click on Format and set the format of the displayed value.

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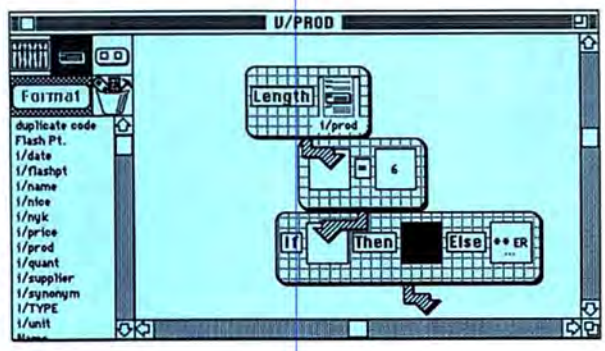
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Double Helix or Nothing: Part 1

Helix checks for consistency between data types of fields used in calculations and also for those cases where a tile will work on multiple type fields. You get a "beep" and error message if you attempt to drag a non-numeric field into a numeric calculation tile or if you mix field types in a manner not permitted. To remove a calculation tile(s) from the calculation, merely select and drag the parts to be discarded into the wastepaper basket next to the word FORMAT in the palette at the left side of the window.

Here's an example using the If/Then/Else tile. It illustrates the stringing together of calculation tiles to produce a more complex equation. The beauty of the *Helix* approach is that anyone with simple mathematical training can look at this and understand what it does — you don't have to be a programmer. If the length of the field *i/prod* = 6, then the result is undefined (a black hole); otherwise, the result is the text field contained in the second hole as illustrated previously. The illustrated V/PROD abacus would be used as validation for the field *i/prod* as discussed previously: if the entered value was not six characters in length, the field would fail validation and the text in the second hole would appear as the error message.

Perhaps the most powerful, if not the most important, tile in *Helix* is the LOOKUP tile. It permits you to look up a value in another (or the same) data relation when a match is found between two data values. These data values can be entered data, calculation results or a combination thereof, *including the concatenation of fields,* and they are *not required to be predefined as keys.* Because of the LOOKUP tile and the ability to maintain multiple indexes, *Helix* data bases do not require a predefined key field or fields to provide a link between different files. This feature distinguishes *Helix* from *all* of its competitors and its value is hard to overstate. One of the biggest problems data base designers are presented with in developing complex systems with multiple files is positioning linking fields in a contiguous sequence that provides the most applicable key for linking index files. The power of LOOKUP eliminates this task and, along with multiple index files, makes a *Helix* data base a living thing (pardon the dramatics) whose ability to grow is not limited to original design limitations.



You build a calculation using tiles in the Abacus window, joining them in building block fashion.

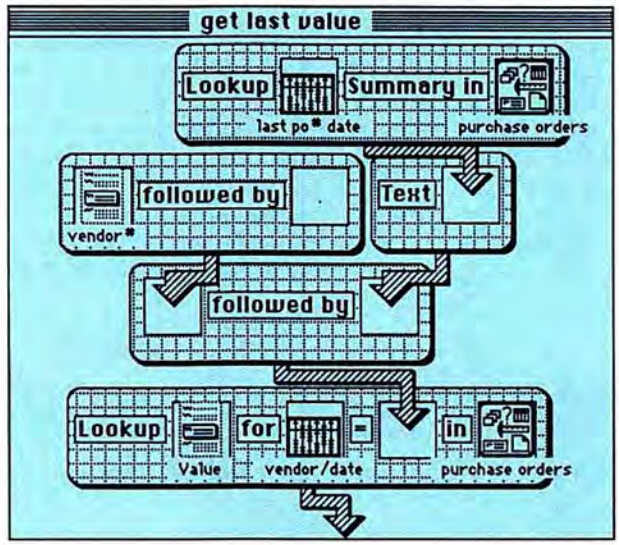
Let's use LOOKUP in a Bill of Material data base. The Materials relation contains a record for each part, purchased or manufactured, which contains the product code number and the product name. The LOOKUP tile shown should reside in the Assemblies Relation and will be used to look up the name of each part as it was entered as part of a bill of material. To construct a LOOKUP, first double-click on the rightmost hole and select, from a list of all relations, the name of the target or linked relation in which the data is to be looked up. Then double-click in both the leftmost hole and the second hole from the left and select from the presented list the name of the data field to be retrieved and the name of the key field in the target relation, respectively. The LOOKUP tile is finished by dragging into the third hole the name of the matching field in the source or linking relation from the field or abacus list on the left. Thus, the illustrated tile says "Lookup the name of the product in the Materials relation which has its prod # equal to the value of the Assembly # field in the Assemblies relation."

All three field definition holes can contain not only entered data values, but calculation results as well, including flag values resulting from complex logical statements and concatenated fields. This provides truly awesome possibilities — the other Mac relational data bases permit look-ups to linked files, but the link can only be done for the most part via a singular linking field or key sequence established as part of the data base structure.

One final note on abacus icons: If you want to retrieve more than one field value from, say, the last purchase order for the vendor, break the previously illustrated "calculation" into two parts contained in separate abacus icons. The first one would be the Lookup Summary and Followed By tiles, and the second would be the LOOKUP tile(s) that would use the first abacus icon in the third hole of the LOOKUP. The reason for this construction is well known to any experienced programmers: Program optimization involves minimizing file input/output; that is, do it once. *Helix* remembers the result of the first abacus (the Lookup Summary) and does not repeat it for each LOOKUP tile used to retrieve various fields from the last purchase order record. With previous versions of *Double Helix,* the technique just described would be the only one available to accomplish the illustrated objective. *Double Helix II*, however, adds the ability to "post" data from one relation to another. Depending on the situation and frequency, Posting may be more efficient than performing a calculation repetitively. Posting will be covered in detail in a later installment of this series.

At this point, you may well be saying "this is fine and dandy, but how does *Helix* know when to perform any of these calculations?" The answer is that everything in *Helix* is driven by the particular Template or form being worked on at the time: If a derived field (abacus icon) is being

displayed on the form or is required by an associated posting operation, then *Helix* performs the calculation, including any linked abacuses required by the displayed or posted abacus. Conversely, no time is spent performing calculations not related to the displayed form or associated posting. This is the nonprocedural nature of *Helix:* you define calculations to produce a result — you do not worry about when or in what sequence they must be performed. It is important, however, to understand the process *Helix* uses to optimize calculations that reference more than one relation if you are to make your system perform at its best. There is more than one way to construct abacus icons to obtain many results.



To retrieve more than one field value from a hypothetical vendor's last purchase order, the "calculation" should be broken into two parts under separate Abacus Icons.

INDEXES IN HELIX

The ability to maintain multiple index files constructed on calculated or derived values, including concatenated fields as well as ordinary data fields, is a major difference between *Helix* and the other major Mac data bases. It is the source of much of *Helix'* s power and flexibility. *Helix* presents views of the data base in different sequences through the use of the index files, not by requiring sorting the file which is the case with all other Mac data bases. The trade off is SPEED versus S P A C E. It is obviously quicker to access an already maintained index file than to sort (especially on large files), but each index file consumes disk space. A multiplicity of index files can slow the system down during data input on large files because every entry of a new or changed record, or a record delete, causes *Helix* to update each relevant index.

Index files are also important because look-ups or qualified summaries (for example, sum of purchase orders for a specific vendor, max date and so on) are optimized if an index is maintained for the key field or sequence. The system's performance will thus be improved by maintaining the appropriate index files. Conversely, throughput or response time will deteriorate considerably in large data bases if these index files are not maintained.

Odesta has improved performance considerably over earlier versions of *Helix* and, while there are always exceptions to any generalization, most complaints about the speed of *Helix* can be laid at the feet of inefficient or improper design of index files in concert with calculation functions. The old *Helix* manuals provided the developer with absolutely no guidance in this area. I am happy to say that the new *Double Helix II* manual does. In fact, it has a whole separate section on optimization.

The multiple index file approach closely parallels that used in mainframe relational data bases. It's superior to having single keys between files and sorting for different viewing sequences, but does require some sophistication on the part of the user to avoid poor system performance. It's really not that difficult; it just takes some effort.

Helix will do its best to remind the user to create an index file if that speeds up calculations. When operating in Full Mode, as opposed to Custom Mode, an audible beep will be heard and, upon pressing COMMAND-Y, the user will be told that performance could be optimized by creating an index based on such-and-such in a named relation.

FORMS DESIGN

Flexibility in forms design, for both on-screen displays and reports, is another strong point of *Helix. 4th Dimension* is the only other Mac data base that gives the user so much control over the appearance of the output. The font, size, style and alignment are selected on a field by field basis, and all fonts available to the System are available to *Helix.*

Positioning of information is at the complete discretion of the user. *4th Dimension* has a greater selection of drawing tools available, *Helix* being limited to a rectangle, but you can paste pictures into the form, either as constants or retrieved from a relation as a data variable. The total capability should meet the needs of all but the most graphically finicky of users. We'll start the next installment by examining forms design techniques in detail.

MAJOR DOUBLE HELIX II FEATURES

Helix is a truly relational system, with no requirements for unique keys for each record. Any field can be a key, or provide a link, to another data file in the system. There is no necessity to define field lengths which means that fields can be added or deleted at any time without requiring time consuming file reorganization or redefinition procedures. *Helix* supports all data types including pictures. It also supports both derived fields — calculated values that are not stored permanently in the record but "float" off other data contained in the file and "inert" fields — a temporary field in which you can enter data to be used by the system for calculation or other pur-

Double Helix or Nothing: Part 1

poses but which is not stored on the file record.

Multilevel indexes can be maintained on any field or combination of fields, including derived or calculated values and concatenated fields. These indexes are updated automatically by *Helix* when any associated data is changed. For example, if you have two data fields for Last Name and First Name, you could maintain an index on the concatenated value of Last Name followed by First Name. This would provide a unique key or index for all the people who were named Smith (unless of course there was more than one with the same first name and even this could be accommodated by adding a sequence value). Any time either a first name or last name were changed, the concatenated value would be recalculated and the index updated. And because *Helix* is not procedural, all of this is done automatically without requiring the user to program it or specify it in any way.

You can update data fields not displayed in the current view and in relations or files other than the source of entry through what *Double Helix II* calls Posting. Posting can be triggered by data entry, printing, dumping (exporting data to a text file) or a scan through the entire file. The latter three conditions can also be subject to selection criteria.

There is no other Mac relational data base that does all of the above. This power, coupled with its nonprocedural nature and resultant ease of use, makes *Double Helix II* unique.

GARY HIRSCHBERG IS A PAST CONTRIBUTOR TO MACUSER WITH MORE THAN 25 YEARS EXPERIENCE IN WRITING SYSTEMS AND APPLYING COMPUTERS TO BUSINESS AND ENGINEERING PROBLEMS. HE IS A FREE-LANCE CONSULTANT, LIVING IN MAMARONECK, NY, WHO SPECIALIZES IN BUSINESS SOLUTIONS AND DATA BASE DEVELOPMENT FOR THE MACINTOSH.

MACUSER RATING

Double Helix II ★★★★½

Follows Mac Interface	■ ■ ■ ■ ■
Printed Documentation	■ ■ ■ ■ ■
On-Screen Help	■ ■ ■ ■ □
Support	■ ■ ■ ■ ■
Consumer Value	■ ■ ■ ■ ■

Comments: *Double Helix II* is a powerful data base management system that is completely nonprocedural. It provides an easy-to-use environment for developing simple or complex systems. Can be used to develop standalone applications and supports a multiuser environment with an upgrade. **Best Features:** Simplicity of use, rapid development time, support of derived fields and the indexing thereof, as well as posting operations. **Worst Features:** Lack of expanding subforms or scrolling on sublists; integration of system structure and data into one file, requiring system maintenance to be done on production data base unless data is dumped and loaded into new system. **List Price:** $595, single user version. Published by Odesta Corporation, 4084 Northbrook, Ill 60062; (312) 498-5615; (800) 323-5423. Not copy protected.

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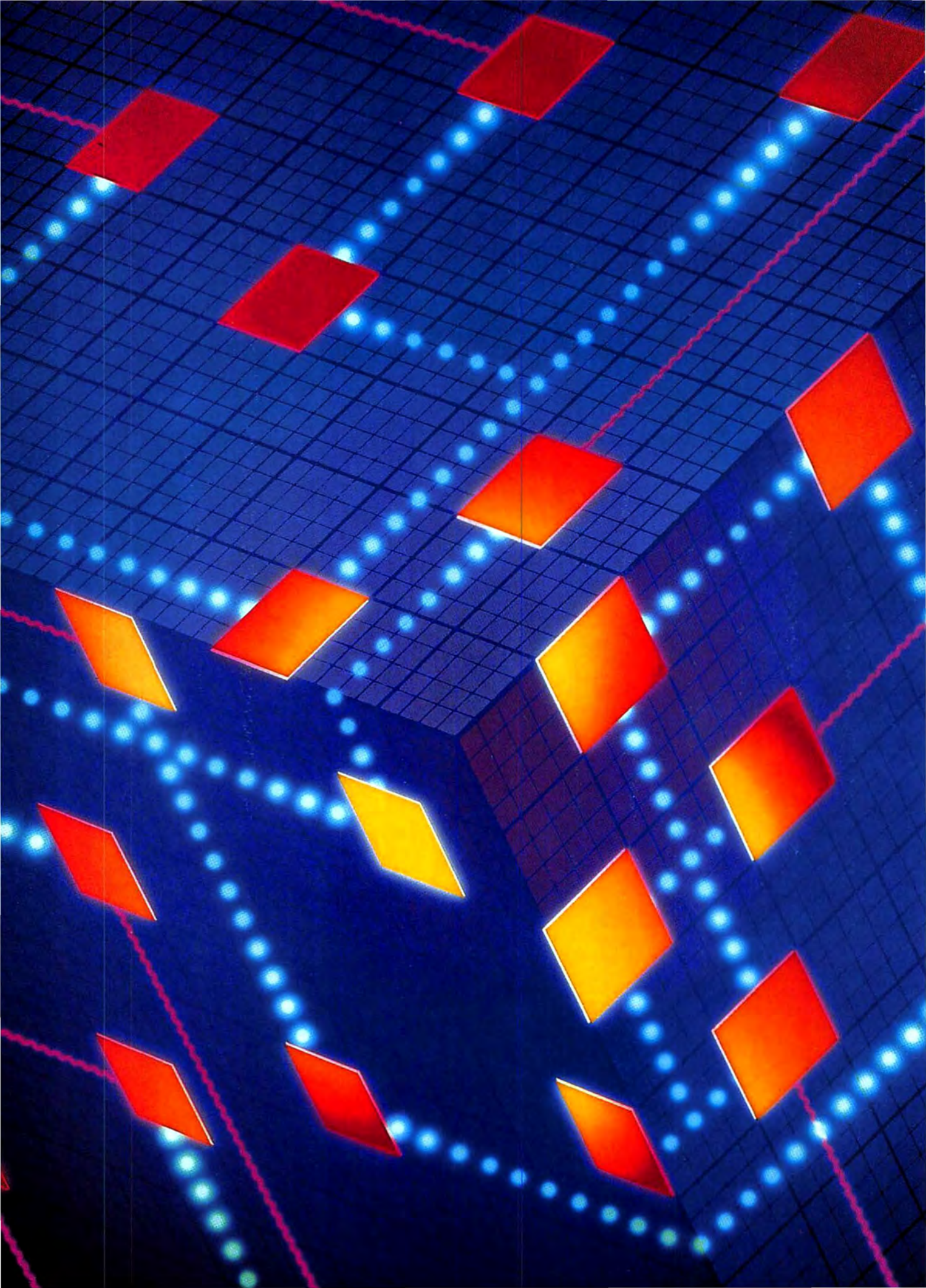
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Taking the Fourth

Owning the most powerful data base is good only if you extract and use that power. Here's how to take 4th Dimension to the limit.

BY LOUIS E. BENJAMIN, JR.

APRIL FOOL'S DAY, 1987, WAS A GOOD day for me. It was then that I first heard of *Silver Surfer,* alleged to be the data base to end all data bases. Over the next several months, rumors flew and finally coalesced into fact. *Silver Surfer* became *4th Dimension,* a real power data base.

In July, I finally had a trial run and was hooked. I spent the better part of several days in Atlanta poring through my copy of the documentation. It was the only reading material I had brought along for the trip. Frequently, I would pause to slap my forehead in amazement, or grin in exaltation over the powerful development system.

4th Dimension is an important step in the evolution of software. It's a system that allows you to create custom applications that don't show the idiosyncrasies and biases of the application used to write it. *Excel* always looks like *Excel. Omnis* applications have a particular look and feel. But *4th Dimension* applications can look like almost anything. In effect, *4th Dimension* provides its users with an expanded toolbox. If the Macintosh toolbox were the equivalent of a hammer, nails, screwdriver and some screws, then *4th Dimension* provides a power drill, a plane and a T-Square. Getting the most from this powerhouse takes some effort and experience; in this article, I'll help you avoid reinventing the wheel.

THE THREE ENVIRONMENTS

4th Dimension is organized in three major layers, which it calls Environments. These are the Design, User and Custom environments. Each environment in *4th Dimension* has a special place in your application. Once you really understand how the three relate, development will move faster.

A lot of the discussion about *4th Dimension* have been about its programmability and the applications that can be designed to run only in the Custom environment, but the User environment is one of *4th Dimension*'s greatest assets. In fact, you can design a complete application with full multiuser capabilities, and never use the Custom environment.

The first layer of *4th Dimension* that you encounter is the Design environment, where the set-up work gets done. This environment consists of a set of Editors that work together in a virtually seamless fashion.

The User environment provides a host of built-in data management functions, giving the user free reign over the system. If all *4th Dimension* had was its Design and User environments, it would still outstrip *Reflex Plus, FileMaker Plus* and all of the so-called flat file managers.

The designer sets the rules in the Custom environment. Nothing is assumed about how your application should look, so you will have to plan to include any features that you would like. For example, you might like the User environment's Search Editor. To provide that feature in the Custom environment, you will either have to provide a menu item that calls the Search Editor, or design your own search editor and attach it to a menu item.

Even if you intend to build a completely customized system, it makes lots of sense to take advantage of the User environment to test procedures and layouts before committing them to the Custom environment. In the User environment, you can test the procedures you're designing with the Execute command.

FILES, LINKED FILES AND SUBFILES

Let's back up for a minute. When you design a relational data base, your system will often have more than one file. The challenge is to come up with a structure that stores data in the most efficient way possible. *4th Dimension* provides several structural options for organizing data.

In some cases, it's simplest to just add a few more fields to the "flat" structure you're working with. Of course, you'll be bending Rule One of relational data bases: "Thou shalt have no redundancy." You don't want to go too far with this, though, because you can get into a problem with inconsistent data. If you go too far with this flattening, you may find that you have to do a lot of work enforcing consistency among procedures. If you reach that point, you have defeated the purpose of your relational data base.

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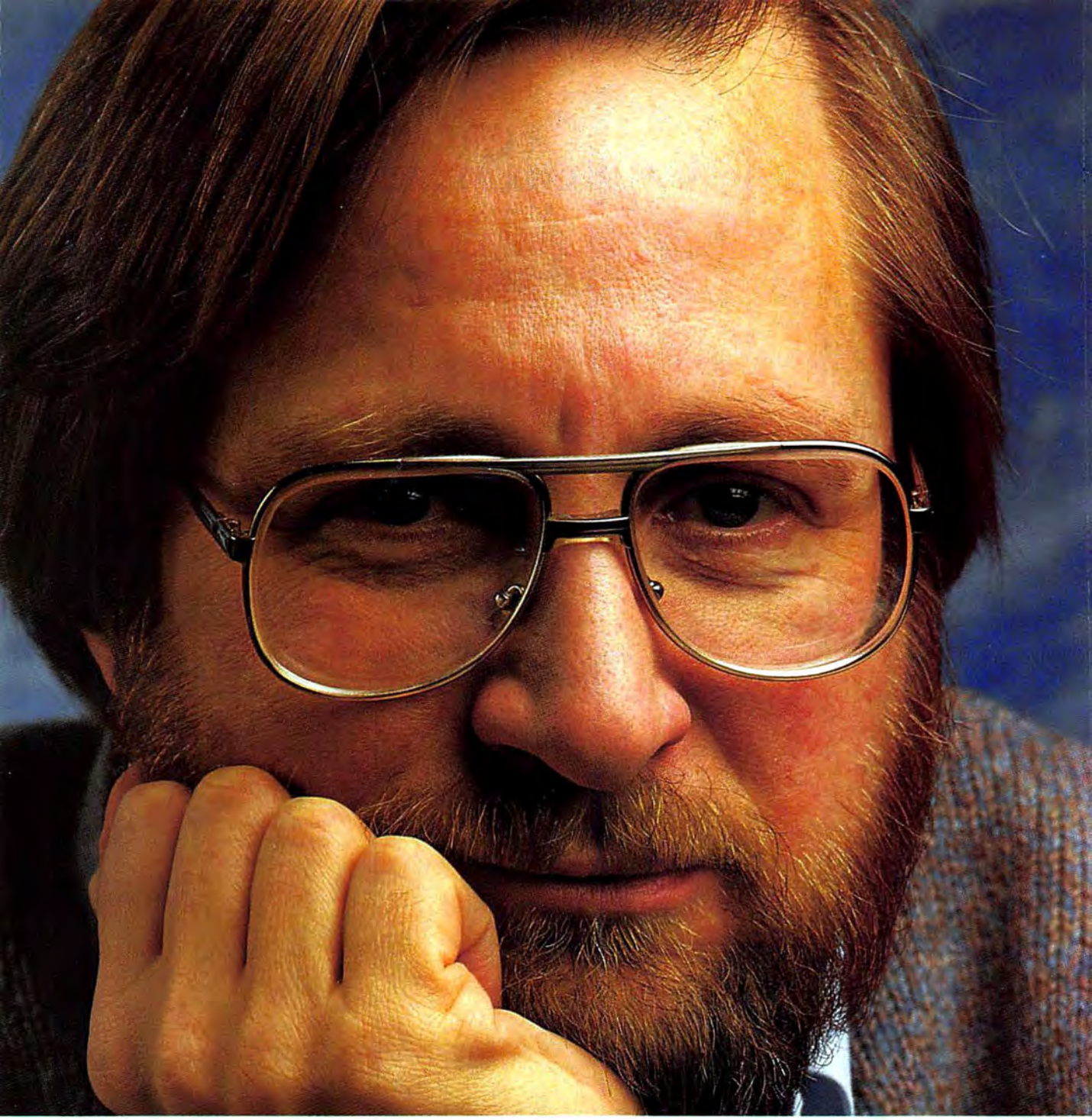
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Lookup *(90,000 word dictionary)* 29.
Findswell *(locate documents fast)* 29.
Spellswell *(spelling checker)* 42.
Spellswell Legal or Medical Dictionary 56.

GAMES

Accolade ... CP
Hardball *(baseball simulation)* 23.

Activision ... CP
Tass Times in Tonetown 21.
Shanghai *(Mah Jongg strategy)* 24.
Portal *(sci-fi novel)* 30.

Addison-Wesley ... CP
Puppy Love *(you and your dog will love it!)* . 19.

Ann Arbor ... CP
Grid Wars *(3D arcade)* special
Normally $22. Free w/purchase of FullPaint.

Avalon Hill ... CP
MacPro Football *(req. 1 Meg)* 28.
MacPro Football 85 Team or Season 16.

Baudville ... CP
Guitar Wizard *(learning tool for guitar)* 22.
Ted Bear's Rainy Day Games 22.

Blue Chip ... CP
Millionaire or Baron 35.

Broderbund Software ... CP
Lode Runner *(over 150 levels)* 24.
Ultima III *(fantasy adventure)* 24.
Ancient Art of War *(military strategy)* 27.
Toy Shop *(create working models)* 30.

Bullseye ... CP
Ferrari Grand Prix *(Formula One racing)* ... 32.
Fokker TriPlane Flight Simulator 32.

Electronic Arts ... CP
Skyfox, Pinball Construction Set, Dr J vs Larry Bird, Archon *each* 15.
Ogre *(tank simulation)* 20.
Patton vs Rommel or Scrabble 27.
Chessmaster 2000 29.

Epyx ... CP
Sub Battle Simulator *(NCP)* 24.



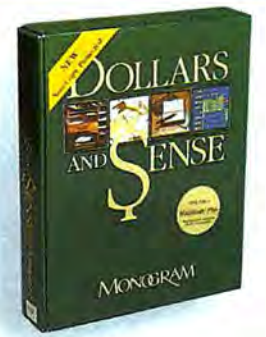
Symmetry ... NCP
HyperDA–Install it as a DA under the Apple menu and you can browse a HyperCard stack, copy to the clipboard, or search a stack all without opening HyperCard $42.

Get it tomorrow.



Microlytics ... NCP
Word Finder—Bust the writer's block! find synonyms of synonyms and replace words without leaving the document or changing punctuation, capitalization or font! $38.

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201 Quicklabels 18.
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Imagine ... NCP
Smart Alarms *(DA reminder system)* 35.
Multi-user Appointment Diary 89.
Infosphere ... CP
LaserServe *(network software)* 62.
ComServe *(NCP, modem sharer)* 124.
MacServe *(network software)* 162.
Innovative Data Design ... NCP
MacDraft 1.2A *(requires 512k)* 155.
Kent Marsh Ltd.
The NightWatch *(hard disk security)* call
MacSafe *(advanced security program)* call
LaserWare ... CP
LaserWorks *(requires 512k, LaserWriter)* ... 189.
LaserPaint *(requires Mac Plus)* 314.
Layered ... CP
Notes for...Excel or Microsoft Works 41.
Notes for...PageMaker or Ready,Set,Go!3 .. 41.
Notes for...Microsoft Word 41.
Legisoft/Nolo Press ... NCP
WillMaker 2.0 *(prepare your own will)* 30.
Letraset ... NCP
Image Studio *(image processing software)* . 279.
Ready,Set,Go! 4.0 *(page layout)* 279.
Linguist's Software ... NCP
Tech *(1000 different symbols)* 59.
FOREIGN LANGUAGE FONTS
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Laser Transliterator 79.
LaserTech 79.
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LaserCyrillic 115.
Living Videotext ... NCP
More 1.1C *(outlines, windows, & tree charts)* 175.
Lundeen & Associates ... NCP
WorksPlus Spell 1.1 47.
WorksPlus Command 61.
MacroMind ... NCP
VideoWorks II *(animation tool)* 119.
MacroPac International ... NCP
101 Macros for Excel 44.
Magnum ... CP
McPic Vol. 1 or Vol. 2 29.
The Slide Show Magician 1.3 35.
Micro Analyst ... NCP
Mac Zap *(recover crashed hard disks)* 39.
Micro Education (MECA) ... CP
Managing Your Money 129.
Microlytics ... NCP
Word Finder *(synonym finder)* 38.
Microsoft ... NCP
Basic Interpreter 3.0 62.
Chart 1.02 *(42 chart styles, CP)* 72.
Multiplan 1.1 or File 1.05 110.
Microsoft Write 1.0 *(w/spell checker)* 105.
Basic Compiler 1.0 119.
Fortran 2.2 *(compiler)* 169.
Works 1.1 *(integrated tool)* 185.
Microsoft Mail *(up to four users)* 195.
Excel 1.04 *(power spreadsheet)* 224.
Word 3.01 *(powerful word processor)* 239.
PowerPoint *(presentations)* 249.
Migent ... NCP
In House Accountant *(small business)* 119.
Miles Computing ... NCP
Mac the Ripper Vol. 3 *(req. Paint program)* .. 27.
Orchestra of Fonts Vol. 4 *(30 different fonts)* . 27.
Peoples, Places & Things Vol. 5 27.
Mindscape ... NCP
The Perfect Score: SAT *(CP)* 46.
ComicWorks *(create your own comics)* 47.
GraphicWorks 1.1 *(newsletters & posters)* .. 87.
Monogram ... NCP
Forecast *(tax planning)* 40.
Dollars & Sense *(home, small business)* 81.
Business Sense *(full-featured)* 282.
Nantucket ... NCP
McMax *(dBASE III compatible)* 179.
Nashoba Systems ... NCP
FileMaker Plus *(feature-packed database)* $149.
North Edge Software ... NCP
Timeslips III *(time & expense tracking)* 119.
Odesta ... NCP
Double Helix II *(relational, custom menus)* 349.
Olduvai Software ... NCP
DA-Switcher *(unlimited desk accessories)* .. 25.
Post ART *(clip art, 3 disk set)* 35.
Icon-It! *(create custom icon bars)* 40.
FontShare *(share PostScript™ fonts)* 159.
Read-It!TS *(OCR software for Thunderscan)* . 79.
Read-It! *(300 dpi OCR software)* 199.
OWL International ... NCP
Guide *(hypertext, free-form info)* 75.
Guide Envelope System 99.



Monogram ... NCP
Dollars and Sense—Unscramble your nest egg. Handles up to 120 accounts, provides on-line help, prints checks, graphs, charts, and reports! $81.

Palantir ... NCP
MathFlash or WordPlay 26.
MacType *(typing instruction, NCP)* 31.
inTalk *(communication to emulation, NCP)* . 119.
Passport Designs ... CP
Mastertracks Pro 259.
PBI Software ... NCP
HFS Locater *(DA organizer for HFS)* 26.
Personal Computer Peripherals ... NCP
HFS Backup 28.
ProVUE Development ... NCP
OverVUE 2.1 *(power-packed database)* ... 149.
Rubicon Publishing ... CP
Dinner At Eight-Encore Edition Bundle 51.
Satori ... NCP
BulkMailer 3.0 *(mailing lists)* 80.
BulkMailer Plus *(up to 90,000 names)* 195.
Legal Billing *(attorneys to accountants)* ... 369.

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Winter Games *(Olympic events)* $24.
Greene, Inc. ... NCP
Crystal Quest *(color arcade on Mac II)* 24.
Hayden Software ... CP
Perplexx *(scrabble-type game)* 24.
Sargon III *(9 levels of chess)* 29.
Infinity Software ... CP
Go *(4000-year-old strategy game)* 21.
Grand Slam *(tennis, req. 512k)* 27.
Infocom ... CP
Leather Goddesses, Nord & Bert, Bureaucracy, Hollywood Hyjinx, Lurking Horror, Plundered Hearts, Borderzone, Stationfall *each* 24.
Beyond Zork 30.
Classic Mystery Library: Moonmist, Suspect, & Witness 36.



Bullseye Software ... CP
Ferrari Grand Prix—Puts you in the driver's seat of a Formula One race car! Includes practice and additional courses, or design your own! . . **$32.**

Science Fiction Classics: Hitchhiker's, Planetfall, & A Mind Forever Voyaging 36.
Zork Trilogy 42.
Invisiclues Hint Booklets *(please specify)* . . . 6.
MacroMind ... NCP
Mazewars+ *(play via modem or network)* . . 31.
Microsoft ... CP
Flight Simulator *(the Mac takes flight)* 32.
Micro Sports ... CP
MSFL Pro League Football 32.
Miles Computing ... CP
Down Hill Racer *(3D ski simulation)* 24.
Harrier Strike Mission II 27.
Fool's Errand *(solve the puzzles)* 27.
Fool's Errand Hint Booklet 7.
Mindscape ... CP
Crossword Magic 30.

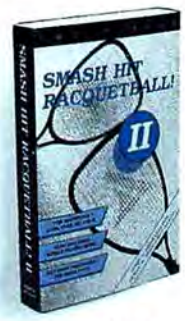
Balance of Power *(world politics)* $30.
King of Chicago *(req. minimum 512E)* 30.
Shadowgate *(castle adventure)* 30.
Uninvited or Deja Vu 30.
Trust & Betrayal: The Legacy of Siboot 30.
Defender of the Crown *(req. 800k drive)* . . . 30.
Olduvai Software ... NCP
Maze Survival *(action game)* 21.
PBI Software ... CP
Strategic Conquest *(multi-user)* 35.
Primera Software ... CP
Smash Hit Racquetball *(top-rated!)* 15.
Smash Hit Racquetball II 22.
Psion ... CP
Psion Chess *(3D and multi-lingual)* 31.
Sierra On-Line ... CP
Leisure Suit Larry *(swinging single life)* 24.
King's Quest I, II or III 30.
Space Quest *(save the universe!)* 30.
Silicon Beach Software ... NCP
Airborne! *(CP, digitized sounds)* 20.
Enchanted Scepters *(CP, over 200 scenes)* 21.
Dark Castle *(top-rated arcade action)* 27.
Apache Strike *(3D helicopter action)* 27.
World Builder *(program creator)* 41.
Simon & Schuster ... CP
Star Trek—The Kobayashi Adventure 24.
Sir-Tech ... CP
Mac Wizardry *(high-rated fantasy)* 35.
SPHERE, Inc. ... NCP
Tellstar II *(No. & So. hemispheres)* 15.
GATO *(submarine simulator)* 26.
Orbiter *(space shuttle simulation)* 26.
Falcon *(F-16 flight simulation)* 26.
XOR ... NCP
NFL Challenge *(w/illustrated handbook)* . . . 64.

HARDWARE

Manufacturer's minimum limited warranty period is listed after each company name. Some products in their line may have longer warranty periods.

NOTE: Some hardware items are available in either platinum or beige color. Please specify.

Apricorn ... 1 year
ApriCord Mac *(for Mac 512k or Mac Plus)* 75.
AST Research ... 6 months
Mac 286 *(MS-DOS on your Mac II)* 1095.
AST TurboScan *(300 dpi scanner)* 1369.
AST TurboLaser P/S 2995.
Curtis Manufacturing ... lifetime
SURGE SUPPRESSORS
Safestrip *(6 outlets)* 21.
Diamond *(6 outlets)* 32.
Emerald *(6 outlets; 6 ft cord)* $36.
Sapphire *(3 outlets; EMI/RFI filtered)* 47.
Ruby *(6 outlets; EMI/RFI filtered; 6 ft cord)* 59.
Dove Computer ... 90 days
Toolkit *(clamp, torx driver & wrist strap)* 15.
SCSI Interface/Port 85.
MacSnap 524 *(512k to 1 Meg)* 175.
MacSnap 524S *(512E to 1 Meg w/SCSI)* . . . 219.
MacSnap 548 *(512k to 2 Meg)* 399.
MacSnap 548S *(512E to 2 Meg w/SCSI)* . . 449.
MacSnap 2S *(1 Meg to 2.5 Meg)* 489.
MacSnap 4S *(1 Meg to 4 Meg)* 969.
MacSnap 8S *(for Mac II, to 8 Meg)* 1939.
MacSnap Plus 2 *(MacPlus to 2 Meg)* 289.
MacSnap Plus 4H *(MacPlus to 4 Meg)* 969.
Ergotron ... 1 year
Mouse Cleaner 360° 15.
MacTilt or MacTilt SE 68.
MacTilt *(for large monitor)* 85.
Farallon Computing ... 1 year
PhoneNET-AppleTalk 120 9.
PhoneNET PLUS *(DB-9 or DIN-8)* 44.
PhoneNET StarController™ w/StarCommand™ software 1395.
PhoneNET StarController™ Wiring Kit: Punch Down Block 69.
PhoneNET CheckNET™ *(multi-user)* 69.
MacRecorder™ Sound System 149.
TrafficWatch *(monitor network)* 159.
Hayes ... 2 years
Smartcom II *(communications software)* . . 88.
Smartmodem 1200 299.
Smartmodem 2400 449.
MacPlus 1200 or 2400 Package call



Primera Software ... NCP
Smash Hit Racquetball—Two-player version of the game MacUser gave 5 Mice! Play via modem, AppleTalk, or direct connect. Four ability levels, instant replay, and more **$22.**

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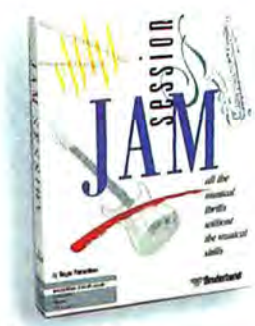
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Kensington ... 1 year
Appletalk Cable Clips or Connectors. *each* $1.
External Drive Cover 8.
Mouseway *(mouse pad)* 8.
Mouse Pocket *(for your idle mouse)* 8.
Mac Plus/Mac SE Cover 9.
ImageWriter II Dust Cover 9.
Printer Stand 17.
Mouse Cleaning Kit w/Mouse Pocket 17.
Disk Drive Cleaning Kit 20.
Tilt/Swivel 22.
Universal Copy Stand 22.
Polarizing Filter *(for MacPlus or SE)* 33.
Surge Suppressor 34.
Apple Security Kit 34.
Printer Muffler *(80 column)* 38.
Printer Muffler *(132 column)* 51.
Printer Muffler Stand *(80 or 132 column)* . . 25.
Control Center 62.
A-B Box *(for the Mac Plus)* 64.
System Saver Mac 64.
Turbo Mouse *(for the MacPlus & SE)* 82.
Koala Technologies ... 90 days
MacVision *(digitizer, includes MoreVision)* 169.
Kraft Systems ... 1 year
3-Button QuickStick 39.
Migent ... 1 year
Pocket Modem *(ext. 300/1200 baud)* 168.
Mirror Technologies ... 1 year
Magnum 800 External Drive *(platinum)* . . 199.
MagNet 30x *(w/cable & print spoolers)* . . . call
MagNet 40x *(w/cable & print spoolers)* . . . call
Magnum Tape 40 Backup call
MSC Technologies ... lifetime
A+ Mouse *(optical mouse)* 69.
A+ Mouse ADB *(for Mac SE & II)* 87.
Orange Micro ... 1 year
Grappler *(universal parallel interface)* 69.
Passport Designs ... 90 days
Passport MIDI Interface 95.
Personal Computer Peripherals ... 2 years
WSI *(connects Apple HD 20 to SCSI)* 295.
MacBottom HD 21 Meg *(SCSI)* 749.
MacBottom HD 32 Meg *(SCSI)* 899.
MacBottom HD 45 Meg *(SCSI)* 1159.
Optional built-in 1200 baud modems
available for the above MacBottom units . . call
MacBottom IHD-144 Meg *(for Mac II; 1 yr.)* 2195.



Broderbund ... CP
Jam Session—Pre-written songs and animated on-screen band make it easy as 1) choosing a musical style, 2) pressing a key, and 3) receiving your Grammy!. $30.

Practical Peripherals ... 5 years
1200 Baud External Modem $109.
2400 Baud External Modem 189.
SoftStyle ... 90 days
MacEnhancer *(for plotters to printers)* 159.
Summagraphics ... 90 days
MacTablet 12" x 12" 379.
Systems Control ... 2 years
MacGard *(surge protection)* 55.
Thunderware ... 90 days
ThunderScan 4.0 with PowerPort 199.
Mac II Power Accessory 42.
Western Automation
DASCH RAMdisk 2000K 399.

DISKS

Double-sided diskettes.
Sony 3½" DS/DD Disks *(box of 10)* 18.
Fuji 3½" DS/DD Disks *(box of 10)* 19.
Verbatim 3½" DS/DD Disks *(box of 10)* . . . 19.
MAXELL 3½" DS/DD Disks *(box of 10)* . . . 20.
3M 3½" DS/DD Disks *(box of 10)* 20.



Olduvai Software ... NCP
Read-It!—The first OCR (Optical Character Recognition) software for any 300 dpi scanner. "Learns" new typefaces, allowing unlimited number of fonts and sizes. $199.

INFORMATION SERVICES

CompuServe
CompuServe Information Service 24.
Grolier's Online Encyclopedia 32.
Dow Jones
Dow Jones News/Retrieval Membership Kit 24.

ACCESSORIES

Clean Image Ribbon Co.
Clean Image Ribbon Kit 12.
Computer Coverup
External 800k Drive Cover 4.
ImageWriter II Cover 8.
Mac Plus or Mac SE Cover Set 10.
I/O Design
Available in navy blue.
Imageware II *(ImageWriter II carry case)* 49.
Macinware Plus *(Mac Plus carry case)* 69.
Macinware SE *(Mac SE carry case)* 76.
Kalmar Designs
Teakwood Roll-top Case *(holds 45 disks)* . . 14.
Teakwood Roll-top Case *(holds 90 disks)* . . 20.



Practical Peripherals ... 5 years
External 2400 Baud Modem—Delivers 300, 1200, and 2400 Hayes compatible operation. Internal speaker and status lights tell which bit is going where $189.

Teakwood Roll-top Case *(holds 135 disks)* 27.
Magnum
Mouse Mover *(let your mouse ride!)* 14.
Moustrak
Moustrak Pad *(standard 7" x 9")* 8.
Moustrak Pad *(large 9" x 11")* 9.
Ribbons
ImageWriter Ribbons 4.
Available colors: black, blue, brown, green, orange, purple, red, yellow and silver.
Rainbow Pack *(6 single color ribbons)* 20.
Multi 4-Color Ribbon *(req. ImageWriter II)* . . . 9.
Sensible Softworks
Quality "MacAttire" nylon dust covers . . . 7-17.
High Trek ImageWriter II carry case 49.
High Trek Mac SE & ext. kybd. carry case 69.
Smith & Bellows
Mahogany case *(holds 90 disks)* 28.

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The next possibility is to set up linked fields. Changing the contents of a "linking" field triggers the layout procedure. If there is a Load Linked Record statement in that procedure, *4th Dimension* automatically finds the appropriate related record in the "linked" file.

In some cases, it's more efficient to use subfiles. Subfiles have some of the attributes of files and some of fields. The Structure Editor allows you to add them to a file as if they were fields, but a subfile can have 511 fields of its own, which makes it more like a file. The great thing about them is that once you read a record, the subfile records that belong to it are automatically loaded, with no additional work!

Sometimes there's no reason to link files at all. The files may have no relationship at all, or only a transitory one. Indexed fields provide a way to use a file in much the same way that you might use a look-up table in *Excel.* Your procedure could then copy the data from the record it found in the "look-up" file into the record you're updating in the work file. When the data in the look-up file changes, the data in the work file won't drift as it would with linked files.

VARIABLES AND FIELDS

In *4th Dimension,* there's a great distinction between variables and fields. One important difference is that a field belongs to a specific file, while variables belong to the system at large. In addition, fields have a specific type, while a variable could contain a number at one moment, text in the next and finally a picture. In other words, the variable's type is flexible. At times, *4th Dimension* is almost too smart. As you design procedures that assign values to fields, you have to be a little careful to use the filename prefix for fields, otherwise *4th Dimension* may assume that you're referring to a variable. The statement LastDate:=Current Date can have a different result than [Orders]LastDate:=Current Date.

LAYOUTS

In *4th Dimension,* layouts come in several varieties, each created in the same Layout Editor. A layout can be used for input only, output to screen only or for both. You could design a layout for printing specifically for use with the LaserWriter, while another is optimized for ImageWriter use.

The Layout Editor, which allows you to create layouts, works a lot like *MacDraw,* with a few exceptions. A major exception lies in how groups are handled. *4th Dimension* does not provide a GROUP command in its Layout Editor, but you can still snare several items with the marquee tool, or by using a combination of Shift-clicks. And *4th Dimension*'s grid tool creates an invisible grid, but you will have to use ALIGN TO GRID when you duplicate objects, since the duplicated objects are simply offset from the original with no regard to the specifications of the grid. I often use the line and box tools to create alignment objects. By creating these items temporarily, I can place fields and text in my layout quite easily, without relying on the grid tool.

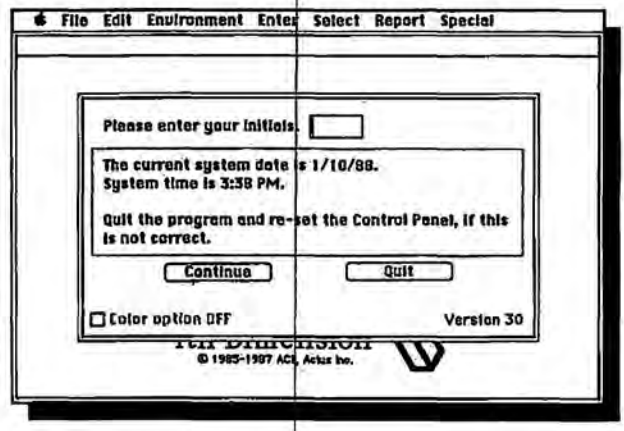
DIALOGS

A dialog is a special form of layout. When you define a dialog, you use the Layout Editor in the same fashion you would to create a conventional layout. However, there are differences in the approach. The dialog uses enterable variables for input and nonenterable variables and fields for display. Note that fields, when used in a dialog, are not enterable.

Once you've designed your dialog, you'll need just a tiny bit of code to display it. Here are the steps: 1. Use the OPEN WINDOW command to create a window. 2. Use the DIALOG command to specify and activate the dialog you're interested in. 3. Be sure to follow the DIALOG command with a CLOSE WINDOW instruction.

BUTTONS AND OTHER GOODIES

Buttons are special variables. Depending on their type, a wide variety of sophisticated features can be added to your system with little effort. Accept and Cancel buttons affect the system OK variable, while plain buttons do not. The system OK variable changes whenever a layout or dialog is accepted or cancelled. You can test to see whether the OK variable is 1 or 0, then have your procedures act accordingly.



This is an example of a custom dialog. Included in this dialog is an enterable variable, messages that include text from global variables, a rectangle border, custom buttons and a dimmed check box button. The check box button text was set within the layout procedure.

Next come the special purpose buttons. Radio buttons automatically group, based on the first letter of their name. Check boxes toggle between a value of 1 and 0. If you intend to use check boxes or radio buttons as a means of representing data, you need to create a small procedure to mediate between the field or variable that holds the data and the button in the layout.

POWER IS WHERE YOU PUT IT

For a lot of people, procedural code is one of the scariest things on earth. Macros in programs like *Excel* helped to destroy the myth that only computer geeks programmed. The key in handling *4th Dimension* programming is to attack your project in segments, adding to the programming in discrete, logical parts like building blocks. If you understand the different characteristics of Global, Layout, File and External proce-

dures, you can blend them into an easily modified and compact system.

Global procedures are not attached specifically to any single file or layout. They can alter the default file, change the current selection of records, select input and output layouts and even serve as functions for other procedures.

Layout procedures are attached to layouts. Each layout has only one procedure, but that procedure can call global procedures and external procedures, which greatly enriches them.

When you begin to design *4th Dimension* applications, the initial tendency will be to design for the User environment, to write too much code and to put all procedures in the layouts.

External procedures have earned *4th Dimension* the title of "the data base with slots." Rather than presume to know everything that a software designer might want in *4th Dimension,* the program was designed with an easy means of grafting custom functions written in Pascal or C into your applications. For example, one developer has worked out a way of adding pop-up menus in layouts. Another procedure allows you to have your data base "speak," using *MacInTalk.* In time, I expect that a number of developers will begin to market extremely creative and useful external procedures for *4th Dimension.*

CALLING ALL PROCEDURES

Once you understand how to write a simple procedure, you can quickly learn to write powerful systems in *4th Dimension.* An essential element in making that transition is understanding that procedures can pass control back and forth. This transfer is known as a procedural call, or "calling."

You may not realize it, but if you've ever used a function in *4th Dimension* (or *Excel,* for that matter), you have used a call. Making a call is also known in some circles as invoking a subroutine, which conveys a slightly clearer image of what happens. In effect, the procedure that was running goes on hold, and the procedure that was called takes over. When the called procedure is done, the first procedure (the calling procedure) takes over again.

I prefer to try to use global procedures as often as possible. I use layout procedures often, and I have yet to use a file procedure. Consider this scenario: I have an application in which I need two different input layouts for an orders file. Imagine that each layout procedure has 20 lines of code, and that only three lines of code in each are different. If I copy and paste the procedure from one layout to the other, then change the code, I will have been fairly efficient in my initial construction. But later, I find I need to add five more lines to each procedure. After the fourth revision, I realize I'm spending a lot of time maintaining parallel sets of code.

If I keep only the code that is unique to that layout in each layout procedure, I can put all of the common code in a global procedure, and call the global from within each layout. In this way, I make it a lot easier to maintain and improve the system.

Global procedures can play an even more important role when you begin to develop custom applications. Such an application is controlled by its custom menus. Selecting a menu item, when you're not in a layout, triggers a global procedure. If you design this global procedure so that you stay in a loop, you can ensure that control always reverts to that procedure. One well-designed central loop procedure can be the nucleus of your system.

Now for an important twist. When a global procedure contains the MODIFY SELECTION command, the effect is the same as if you had made a call to the layout procedure of the default file. When you cancel the layout, the global procedure that first invoked MODIFY SELECTION regains control.

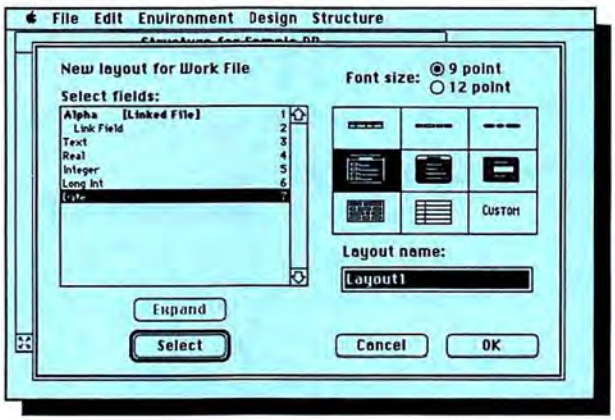
BEFORE, DURING AND AFTER

Layout procedures are extremely powerful and flexible. The flexibility of these procedures is enhanced by the three system variables Before, During and After. By using If statements, you can orchestrate when certain layout functions are performed.

To better understand the three phases of layout procedures, consider this: Layouts are essentially data filters. A layout can display all the data in your system, some of it or only some representation of it.

Menu bars are inactive when you are in a layout, since the layout procedure is in control. Generally, I make sure to dim my menus when layouts are invoked, and relight them when I'm back at the so-called splash screen. If you want to provide menu control from within your layouts, you'll need to add a simple menu handler procedure. Make your menu handlers global procedures and call them from the layout procedure. In an input layout, a During phase is generated when a menu is pulled down. In an output layout, there is no During phase. If the menu handler procedure is called Handle Menus, then the output layout's procedure would simply contain the instruction "Handle Menus," with no If's, while the input procedure could contain the command If (During).

(continued on page 128)



Defining a new layout. Note the choice of point size and the numbering of the fields that have been selected. There are eight standard formats. The custom option brings up a blank layout palette, generally used for defining custom dialogs.

PARAMETERS

If you use the command ALERT ("How are you?") in *4th Dimension,* the result is a dialog box containing that message with an OK button. The ALERT command uses a parameter, which is the message phrase you supply. As you begin to design your own *4th Dimension* procedures, you can create function procedures, which can both accept parameters as arguments and return results.

Suppose you wanted to create a special function called Blend. A typical use of this function might be: vMessage:=Blend("The current temperature is";vTemp;"degrees.").

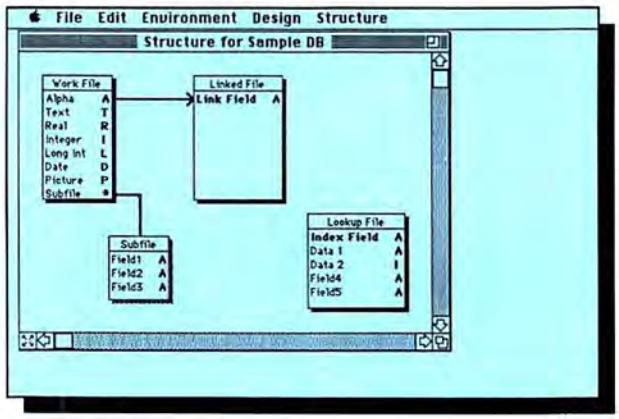
vTemp is a real number variable that contains the current temperature, perhaps acquired from a probe attached to the serial port. This function call contains three parameters, separated by semicolons. The result will be a single string such as "The current temperature is 47.5 degrees."

Now let's take a look at the blend function itself. The procedure would read:

```
` Global proc: Blend
` Combines a string, a number, and another string.
$0:=$1+""+String($2)+$3.
```

Looks cryptic, doesn't it? Not really. $0 is the name *4th Dimension* reserves for the value that is returned after the procedure is completed. $1 is the local variable that *4th Dimension* established for the first argument listed in the function call. In this case, $1 contains the phrase "The current temperature is." Similarly, $2 holds the value of vTemp and $3 is "degrees." This custom function calls the standard String function to convert vTemp to a form that will meld properly with the text arguments, and spaces are added before the result is sent back to vMessage in the $0 variable.

Instead of writing long, complicated procedures, it makes much more sense to create small procedural packets, then string the small packets together. This is much more legible in the short run, and easier to expand in the long run.



The Structure Editor at work. Demonstrated here are several structural alternatives, including subfiles, linked files and standalone files with indexed fields. You can also see the various field types available in the Work File. Note that indexed fields are in boldface.

A DESIGN IN PHILOSOPHY

The secret of any well-designed data base lies in planning ahead. At the same time, good data base software provides a great degree of flexibility to support the inevitable unplanned revisions. *4th Dimension* makes revisions simple, and makes designing the structure quite easy.

Since the Structure Editor is graphic, it is easy to establish relationships between files, and to print out a map of the structure. By having a clear map of the structure to refer to, a good deal of confusion can be avoided.

It is also a good idea to develop a "data dictionary" whenever you begin to design a more complex system. This is a list describing the use intended for each field and file in your system. You'd be amazed at the number of times you create duplicate fields in a complex system, simply because you forgot that one was already there.

You can include a simple data dictionary in each of your *4th Dimension* projects by creating a file with a Name field and a Description field. Since the data dictionary is for your own use, just add input and output layouts, and maintain it in the User environment. Once you have designed the layout visually, you can add procedures as needed.

As often as possible, you should design the file structure and all fields first. If you think it through completely, you'll be able to build your entry layouts easily, and if you include linked fields in the layouts, *4th Dimension* will even generate a great deal of your linking code for you.

Your file structure can have an impact on the user interface of your design, so it's good to think in terms of how you expect someone to operate the system. As you design, you should be thinking about what a typical session might feel like.

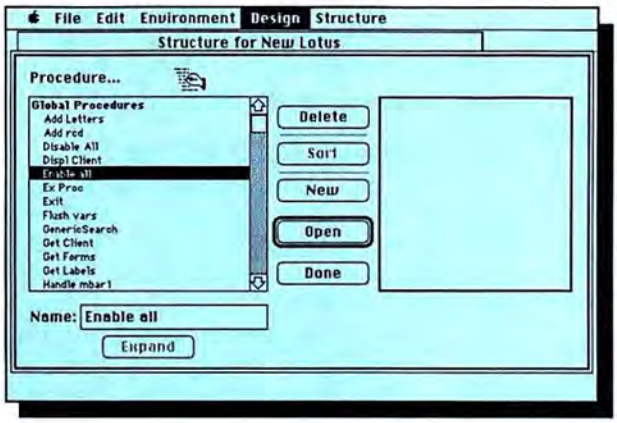
One important aspect of *4th Dimension* is the rich palette of features that give incredible latitude in the kind of user interfaces you can design. *4th Dimension* gives you a number of boilerplate options, and it's quite simple to expand upon what's already there.

However, it's so easy to create multiple entry screens, subfiles and included layouts for a *4th Dimension* system, that you have to police yourself a little. If you're designing a system for other people to use, try to keep the look of screens consistent, and try to provide useful labels so that your users don't get lost in the maze of your application. No one else will have the complete mental picture of the system as you envision it, so try to provide good road signs.

It's also easy to catch the coding bug, once you've written a few procedures. The key is to work smarter, rather than harder. Don't write 20 procedures when a few well-placed If statements will suffice.

Do the coding one step at a time, by breaking up the task into logical components, then string the small pieces together. Your life will be easier.

Also be sure to sprinkle comments liberally. A comment can be added anywhere by preceding the comment with an accent grave (`) character. Everything to the right of this character will be ignored, so you can put comments on the same line immediately after an instruction.



When you open or create a procedure, you'll encounter this dialog. Note the Sort button, which alphabetizes your procedure names. It comes in quite handy. As you create new procedures, they are added at the bottom of the list, until you re-sort. When you open a layout procedure, the layout is shown in reduced form in the right-hand window.



The Procedure Editor feels pretty much like a standard word processor. Text can be easily cut and pasted. *4th Dimension* functions appear in bold, external procedures appear in bold italic and procedure calls appear in italic. The "$" signs indicate local variables, and the "'" character precedes comments.

I always label my procedures before entering a single line of code. You'll appreciate this the first time you trace through a bunch of code, wondering which procedure you're in.

Remember that you can temporarily turn commands on and off by converting them to comments and back. This is especially helpful when you want to add TRACE commands.

THE JOY OF SETS

Set notation opens a completely new vista in the Mac data base arena. Complicated processes like dupe elimination for mailing lists can be immensely simplified and speeded up through the use of sets and the set math functions.

In order to understand sets, you should know that data base managers make use of something called a pointer to locate a particular record. Each record in a data base has a unique pointer, and these pointers are very compact, so that a large number of records can be represented by a set of pointers, which takes up very little memory.

The other thing to understand about sets is that *4th Dimension* knows quite a bit about dealing with groups of records. In an accounts receivable system, for example, a number of clients might have an open balance more than 30 days old. If you perform a search for open records that are more than 30 days old, you may come up with 100 records. While your system might contain 1000 records, the 100 you are working with would be the Current Selection, and any one of those records will become the Current Record when you activate it. If you use the CREATE SET command, your current selection will be remembered by that name. Later, if you call Use Set, you can restore that group of records as the current selection.

4th Dimension automatically maintains one other set for you. The UserSet is the set that specifically contains the records that have been selected by the user. This may only be the current record, but you can Shift-click or Command-click large numbers of records, creating a subset of the current selection.

Once you can create sets, you can manipulate them with the INTERSECTION, DIFFERENCE and UNION functions. INTERSECTION will allow you to create a third set that contains the records that each set has in common. DIFFERENCE will subtract any records in one set from those in another to create a third. Finally, UNION combines all records in both sets to create a third set.

Sets normally reside in memory, but you can save a copy of a set to disk with the SAVE SET command. Later, you can restore that set by using LOAD SET.

The dark side of sets lies in the fact that sets rely on record pointers. When a record is deleted in *4th Dimension*, its pointer is not retired, since that would waste space on the disk. Instead, the pointers of deleted records are recycled when you need to create more new records. *4th Dimension*'s sets are not "informed" when a record in a given set has been deleted. As a result, a set may later become invalid when new records have been added. This generally isn't a problem when you create your sets "on the fly," using them briefly and then discarding them, but you could have a problem if you rely heavily on saved sets.

DEALING WITH THE REST OF THE WORLD

4th Dimension offers a wealth of options for moving data into and out of its files. It even allows for complex communications through the serial port. With the powerful commands SET CHANNEL, SEND PACKET, RECEIVE PACKET, SEND RECORD and RECEIVE RECORD, *4th Dimension* can read and create text files, or communicate through the serial port with a vast array of devices.

For example, SEND RECORD and RECEIVE RECORD can be used to quickly backup and restore the data from any file in your system. These commands save data in a *4th Dimension*-specific file structure, so that all subfile data is transferred intact.

As you develop the procedures,

such as menu handlers and StartUp procs, that will become the foundation of most of your systems, you should create some sort of library of tricks. You can copy all procedures and layouts and paste them into the Scrapbook for archiving. They will paste into your next application intact. With layouts, you'll probably need to redefine the fields, but that's all there is to it.

MULTIUSER CONCERNS

Multiuser development is fairly straightforward in *4th Dimension.* One key to keeping users from losing access to records longer than necessary is to make regular use of the UNLOAD RECORD command. This command unlocks a record once a user has modified it and accepted the record.

4th Dimension works well in multiuser mode with *TOPS. 4th Dimension*'s multiuser features require AppleTalk Filing Protocol support, which is not provided by *MacServe.*

There are a few commands to avoid, if you're writing an application for multiuser installation. The possible problems with saved sets are only increased when you are in a multiuser environment. Another command that should be avoided, or at least used judiciously, is SAVE VARIABLE.

Export and import to *Excel* can be handled entirely in *4th Dimension*'s User environment, without a single bit of code. All you need is a layout containing the fields you want to export in the order you desire. Set this layout as the output layout, then export, using the text option.

Although *4th Dimension* offers SYLK as an export option, there's a problem with the file format that causes problems with dates. It can be avoided if you use the text option.

When you want to import from *Excel,* use SAVE AS in *Excel* to create a text file. You will need to go to the last cell in your spreadsheet, then drop down to the next row and put any arbitrary character in that cell before you save the text file, though. Otherwise, your last row of data will not get saved in *4th Dimension.* The reason for this is that every row of data in an *Excel* spreadsheet is terminated with a carriage return, except the last one. *4th Dimension* looks for the carriage return to trigger saving the imported data. Adding the character at the bottom of the *Excel* sheet creates a "dummy" row that does not end with a carriage return, and causes the last real row to receive the necessary return.

If you are more ambitious, you can create complex formatted matrices of data to send to *Excel* using the SEND PACKET command. Text files created in this fashion open in *Excel* as text, but can have sophisticated row and column positioning. To do this, open a text file with SET CHANNEL and use SEND PACKET to transfer values, separated by tab characters, to the file. Be sure to end each row with a carriage return. At the end of the file, close it off with one last carriage return, then use SET CHANNEL (11) to close the document.

In a reverse procedure, RECEIVE PACKET can be used to read a text file created with *Excel.* Assuming that you know the structure of the spreadsheet you are reading, opening the file in this fashion can be used to perform extremely complex manipulations on multiple records and files.



***4th Dimension*'s interactive debugger can be reached in three ways. First, you can add a TRACE command to your code. You can get there at any time by holding the Option key and clicking the mouse. Finally, if there's a syntax problem in a procedure that *4th Dimension* is running, a dialog will appear that allows you into the debugger to check things out.**

TALKING TO THE SERIAL PORT

Remember that SET CHANNEL can be used either to create a text file, or to initialize the serial port. The ON SERIAL PORT CALL command can be used to create sophisticated asynchronous communication routines in your applications.

I have seen reports of one developer who has designed a system that can call the credit card bureau and request authorization for several sales at once. It then updates each of the records with the appropriate authorization code.

WHERE TO NEXT?

If you want to try out *4th Dimension* for yourself, Acius (the US publisher) can provide you with an excellent sample kit. This kit contains a fully functional version of *4th Dimension* that only limits the number of records it can contain.

If you're already writing *4th Dimension* applications, you can find superb and fast support in the forum that Acius sponsors in MAUG's APPVEND section on CompuServe. Acius also provides tech support by conventional phone lines, with a very good staff of patient and knowledgeable people.

The Fans data base, which is available for downloading from CompuServe, is a *4th Dimension* application that is actually in use at Acius. It tracks incoming tech support questions and solutions provided, so that each tech person can query the data base as you call in. In that way, some very complex problems can be solved quickly and accurately.

With less powerful data bases, the old adage is "When all you have is a hammer, everything looks like a nail" applies. With *4th Dimension,* you'll have a full set of power tools for just about every job.

LOUIS E. BENJAMIN JR. IS A 4TH DIMENSION DEVELOPER, AUTHOR AND CERTIFIED MACAHOLIC. HE LIVES IN BROOKLYN, NY, AND HAS BEEN SEEN IN BOSTON AND VARIOUS WEST COAST LOCATIONS.

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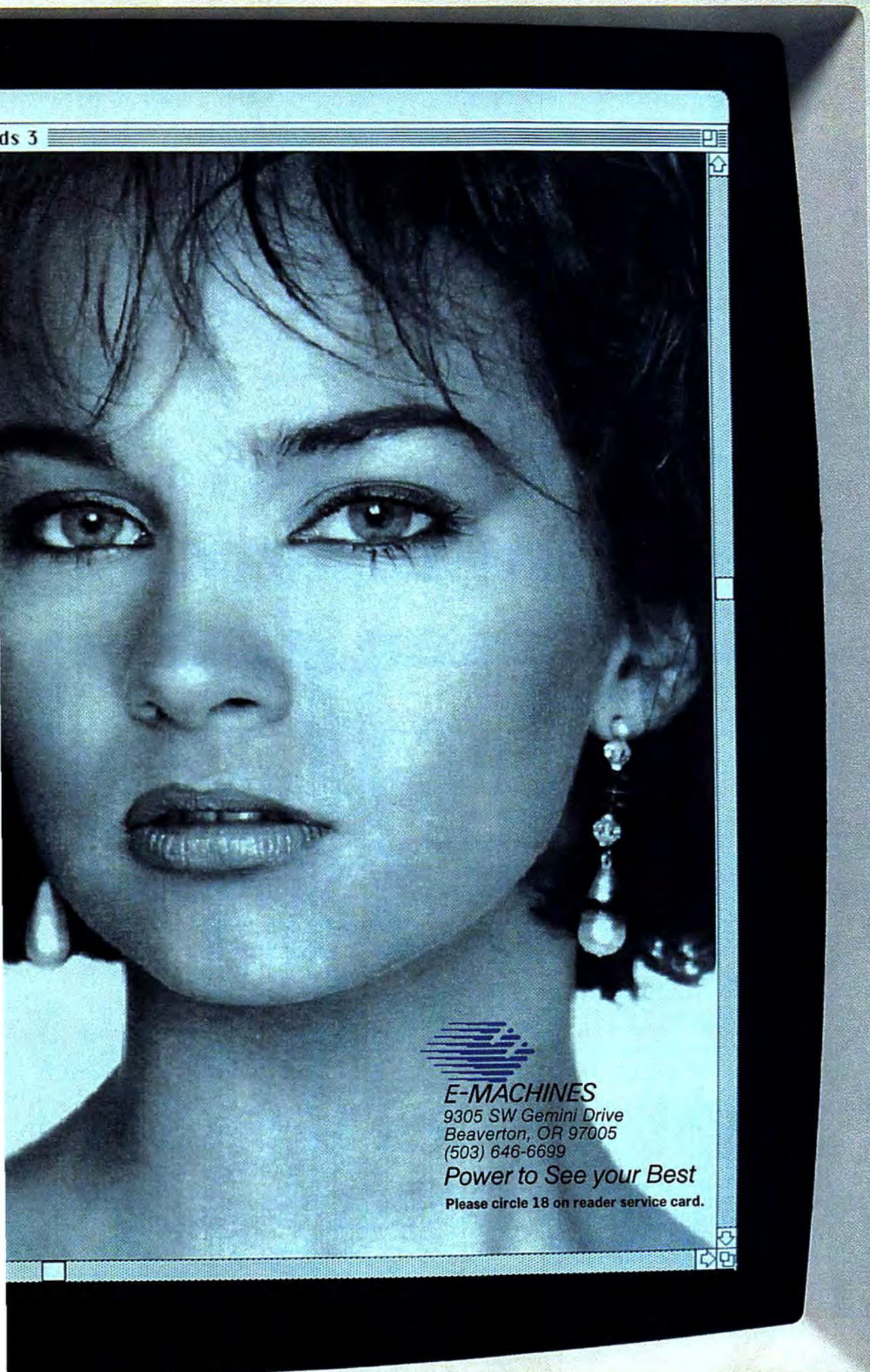
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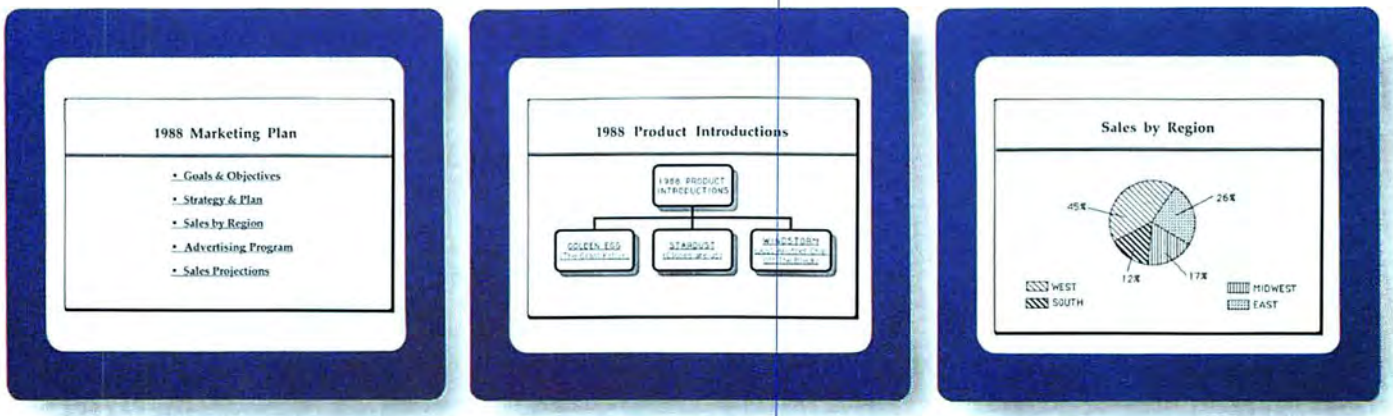
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SPECIAL



MACWORLD EXPO REPORT

It's a Mac, Mac, Mac, Mac World

The Macintosh emerged as a legitimate corporate computer at the Macworld Expo in San Francisco, but it hasn't forgotten its roots.

THE SAN FRANCISCO MACWORLD Expo is *the* event for people and products in the Mac community to see and to be seen at. This year, an estimated 45,000 attendees were exposed to what seemed an equal number of Mac products. There were stars and has-beens, even a *Crystal Quest* "Dumple" marauding the aisles. There were gems and fool's gold, and a few diamonds in the rough. It was all there: the good, the bad and the ugly. Not to mention the real, the unreal and the really unreal. (To say nothing of the really good, the unreally bad and the really unreally ugly.) Let's start with the good.

THE GOOD

Three welcome trends were in evidence everywhere you looked: color, video and HyperActivity.

The arrival of a slew of Mac II boards ushered in a new age of color desktop publishing and desktop video production. Input devices — like video frame grabbers and high-resolution color scanners — let you marry Mac-generated graphics or scanned color images to video. Once the still or moving images are digitized in the Mac, video effects that previously were available only to big league players (like video production houses and TV stations) are simple and financially within reach of anyone with $10,000 to spare.

Several new 24-bit color boards for the Mac II push the number of colors available to almost 17 million, up several quantum leaps from the limited palette of 256 colors on the older 8-bit boards. The subtlety of shading that can be done with that many colors exceeds the eye's ability

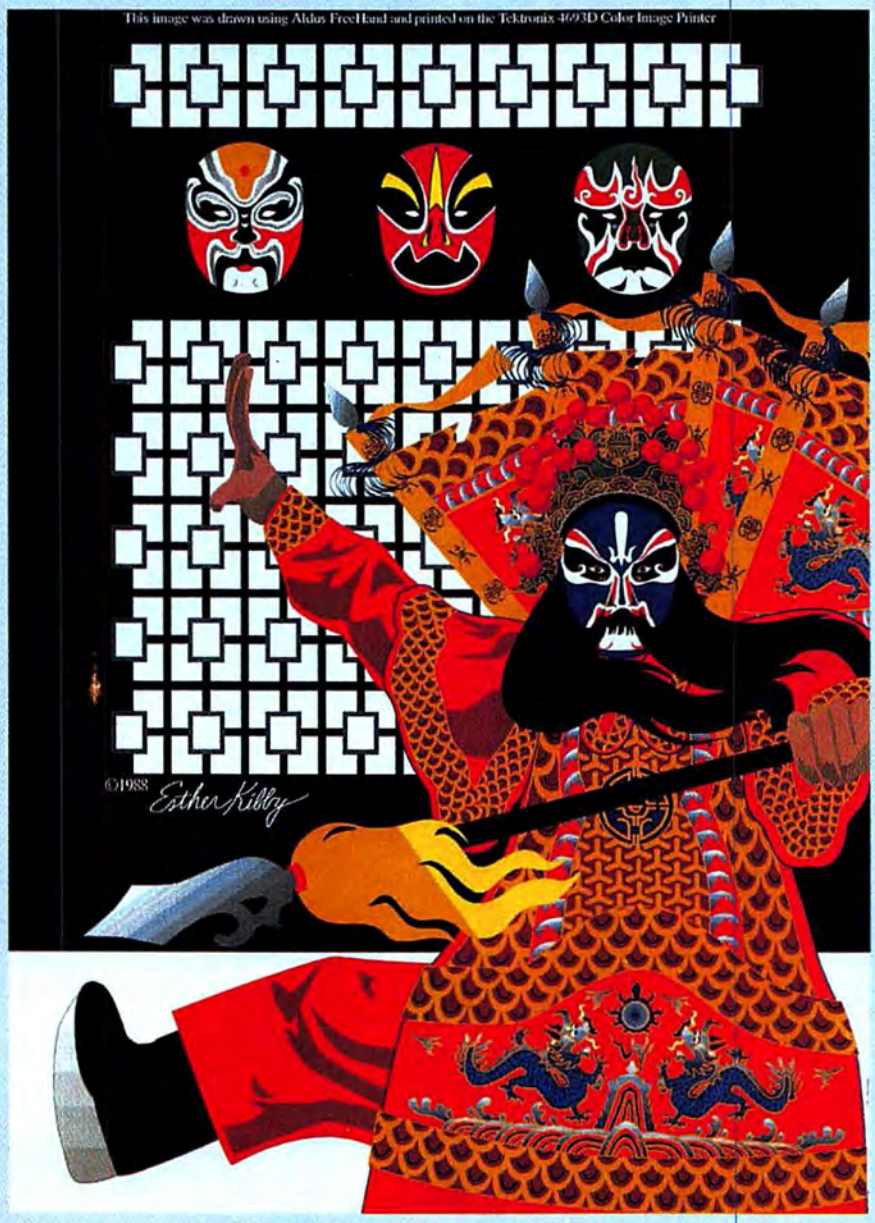
BY JON ZILBER

REPORTED BY BEN TEMPLIN AND RUSSELL ITO

to differentiate among hues. The 24-bit boards from SuperMac and RasterOps generated enthusiasm from everyone passing by their booths. Truevision, maker of the popular Targa boards for the PC, was also expecting to be shipping color boards by mid-year.

A wide range of input devices was on display. We were impressed by MegaGraphics' MegaShot board for the Mac II, which digitizes a frame from any video source such as a camera or VCR. TV Producer, a $599 Mac II board from Computer Friends, overlays graphics and text onto a video signal. Mass Micro's 8-bit board, called ColorSpace, does the same thing and doubles as a video interface for your monitor. It should be out by the time you read this and lists at $1485.

Color software — like *Illustrator 88* from Adobe, *PageMaker* 3.0 and *FreeHand* from Aldus, *Pixel Paint* from SuperMac and the new *MacDraw II* from Claris — was playing on monitors everywhere, shouting their message of "At long last color!" to everyone within eyeshot. Of course, only *Pixel Paint* was actually shipping at the show.



A flashy example of the Tektronix 4693D color thermal printer's output, created using *FreeHand* from Aldus.

For color output, Moniterm and SuperMac Technologies were showing 19-inch color monitors for the Mac II. For hard copy output, the Tektronix 4693D Option 44 color thermal printer didn't win any prizes for catchiest name, but mesmerized passers-by with its stunning 300 dpi QuickDraw output (with prices starting at $8500).

For still image color input, Sharp announced the JX-450, a color flatbed scanner with a resolution of up to 300 dpi. Using three lamps (red, green and blue), the JX-450 can scan a color image in one pass. Truvel's TZ-3 900 dpi scanner is also a one-pass machine (although a three-pass version was running in their booth for a more dramatic on-screen effect) and takes about 25 seconds to scan an 8½-inch X 11-inch document. A 24-bit color version lists for $7400 and a 256 gray scale version lists for $5495.

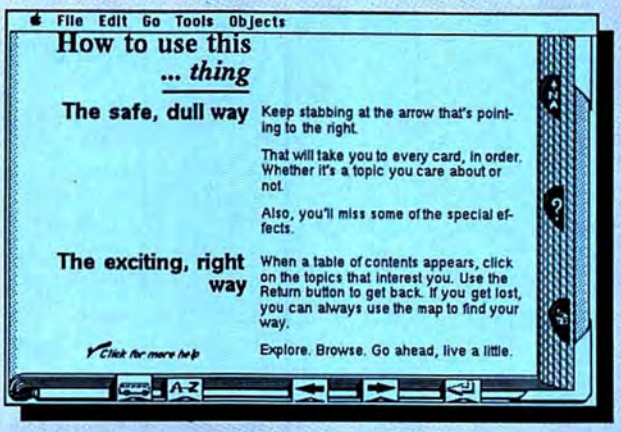
Other color goodies: a utility that allows SuperMac's *Pixel Paint* documents to be printed as color separations; the announcement of Quark's *XPress* 2.0 that will support PANTONE colors, widely used by graphic artists; SlideScan from SuperMac (known as BarneyScan in the IBM world) which digitally scans 35mm slides; and an agreement announced between Microsoft and Genigraphics that will allow *PowerPoint* users to interface directly with Genigraphics color slide service bureaus.

Orchid Technology also deserves a pat on the back for ColorVue SE, the first color video card for the SE, which outputs the SE display to an external color monitor. Unfortunately, the ColorVue only displays 16 colors (from a palette of 4096) and the SE's internal monitor can only display a redundant black and white copy (or a FatBits closeup) of the original. If the internal and external displays could show independent screen views, the ColorVue would be a candidate for best of show. Still, SE owners who need color immediately now have at least one option.

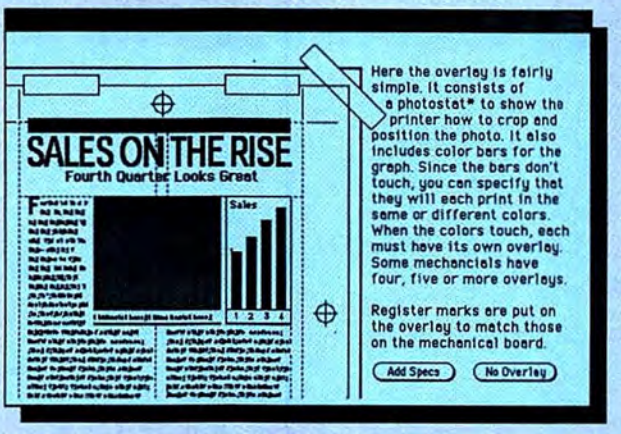
The other omnipresent trend was the proliferation of *HyperCard*. *HyperCard*-based product demos were everywhere. Demo stacks for Farallon's *MacRecorder* and *PhoneNet*,

Interleaf Publisher, AEC's *Information Manager,* Migent's *In-House Accountant* and Microfinancial's *Flexware* were all available at the show. And to find all these exhibitors, Apple produced a stackware guide to the exhibit floor. (Apple could have won a lot of points with attendees by giving away this stack, which included the addresses and product information for all the companies at the show.)

Most of the stackware at the show was public domain and shareware being sold by the megabyte. But there were a few commercial products around. *MacTimes* has compiled a directory of clip art as a stack (and in hard copy). The text of *MacWEEK* magazine is now available monthly on the *MacWEEK News Stack. The DTP Advisor* from HyperSoft makes excellent use of *HyperCard*'s animation capabilities and combines two functions in one stack. It contains reference materials on the art and science of publishing and printing and also acts as a tool for tracking and managing publishing projects.



A sample card from *Interleaf Publisher*'s demo stack.



The *DTP Advisor* from HyperSoft helps keep all you budding publishers in line.

Not surprisingly, there were several new books, magazines, newsletters and, of course, stacks devoted to news about *HyperCard* itself. The meta*HyperCard* stacks include *HyperNews* and *HyperJournal.* And Danny Goodman's epic finally has some competition: There were two more books on scripting — *HyperCard Power: Techniques and Scripts* from Addison-Wesley and *HyperTalk Programming* from Hayden.

For those who want to actually use *HyperCard,* not just read about it, there were several user and programming utilities available. *The HyperCard Construction Kit* from Telesis Software Systems adds an extensive collection of buttons, cards, artwork, audio and visual special effects, reference materials and scripts to the basic tools included with *HyperCard.* And *HyperDA* from Symmetry lets you browse stacks and perform many HyperTalk commands (like pushing buttons and finding text) as a desk accessory while running any Mac application. Unlike *HyperCard*'s 1-megabyte memory requirement, *HyperDA* only requires 512K. (The on-screen manual for *HyperDA* is, of course, a stack.)

Surely and not so slowly, *HyperCard* is integrating with other applications, with a proliferation of software front-ends, add-ins and external commands. Version 3 of *MacSMARTS* from Cognition Technology uses *HyperCard* as a front-end interface, bringing expert systems to *HyperCard* and vice versa. Want to add sound and animation to *HyperCard*? *HyperAnimation* from Bright Star Technology is a sort of visual *MacInTalk* (but not quite as articulate) for *HyperCard.* It combines a grainy digitized video of someone talking and speaks whatever sentence you type in. *HyperANIM,* a 256-color animation tool from Aegis, was also announced for the Mac II, and MacroMind announced a driver that lets you use *VideoWorks II* "clip animation" from within a stack. *HyperSound,* the software portion of Farallon's *MacRecorder* audio digitizer, lets you attach digitized sounds to *HyperCard* buttons.

Two commercial stacks from Activision were announced, but not released at the time of the show (although they should be available by the time you read this): *REPORTS!,* a much needed *HyperCard* report generator, and *City to City,* a domestic version of their *Business Class* travel planner. Hyperpress Publishing also pre-announced Dan Schafer's *Script Expert* (a HyperTalk script-generating stack), an art librarian and a spelling checker for *HyperCard.*

THE BAD

If there was a down side to all of this HyperActivity, it was that most of the *HyperCard* products announced were tools to help you create more stacks to help you build yet more stacks. *HyperCard* continues to be the primary application for *HyperCard.* We hope that the next show will see more stacks that actually do things that have nothing to do with *HyperCard.*

And the Macworld Expo itself showed its growing pains. San Francisco's Moscone convention center was cramped, and business users complained that there weren't

enough opportunities to handle their big accounts. "All these kids and families get in the way," said one SuperMac employee. The information that this year's Boston Macworld show (and probably next year's San Francisco show) would be split between two locations prompted more gripes from exhibitors and attendees alike.

A particularly ominous specter haunted the show: the continued possibility of a standards war between QuickDraw and PostScript. Adobe's Display PostScript lets you see on the screen what you're *really* going to get when printing with a PostScript laser printer. It's an elegant idea, but with so much software and hardware (including low-end laser printers from General Computer and from Apple itself) built around QuickDraw, it's a little late in the game to be shifting gears. However, Digital Equipment announced plans to adopt Display PostScript for DEC machines shortly before announcing its technology alliance with Apple (discussed below). No matter how this one turns out, there will be some battle scars.

AND THE UGLY

Ugliness is in the eye of the beholder, and does not necessarily make for a bad product. With that in mind, the "Ugly Duckling" award winner is the Automatix AI 90, which is basically the guts of a Mac II in an industrial strength case, with power and temperature monitoring and diagnostics added on. It's not pretty, but this industrial device controller is designed to take a pounding.

Another new Mac-in-the-box was the Rack II, a rack-mountable Mac II from Julian Systems intended for audio/visual production studios.

Also in the ugly-but-useful category is the THiNGi from Advanced Gravis. The THiNGi is a plastic strip with a clip at one end and a velcro strip at the other end that attaches to the top of your Mac. It holds papers at eye-level and is easily removed when not needed. (Our etymological research reveals that while the manufacturer may have intended the pronunciation to be "thingy," the correct pronunciation is "thin-jye," as in the plural of "thingus," as in fungi and fungus.)

Videotrax, from Alpha Micro, is a crude but highly effective hard disk back-up system that lets you back up your data onto standard video cassettes via your VCR. It's slow (1.3 minutes per megabyte), but its beauty is that once the data is transferred to video cassette, it can be broadcast, recorded and restored at thousands of sites simultaneously.

Another heavy-duty useful product: DuPont introduced a Mac II Fiber Optics Communications Card that makes it easy to adapt a Mac II to Tempest environments (in which, generally for security reasons, all electrical components must be shielded to prevent electromagnetic emissions).

THE REAL

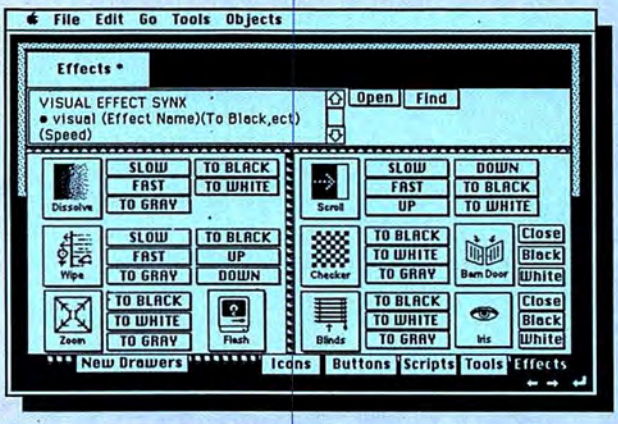
The Mac itself finally showed signs of being a real alternative in the much sought after corporate market. Large corporations have been slow to consider the Mac for one major reason: the vast base of data stored on IBM and other mainframe computers. There have been third-party connectivity solutions before, but now there are official Apple solutions.

Apple introduced *AppleShare PC,* a software/hardware combination for connecting MS-DOS PCs to *AppleShare* file servers and other peripherals, including Apple's new family of LaserWriters. With *AppleShare PC,* a PC is treated like any other node on the network. Several user-configurable options simplify the transfer of files from MS-DOS applications to the Apple environment. For example, a PC user on the network can specify that any *Lotus 1-2-3* files being sent to Mac nodes on the network should first be converted to *Excel* format. Once the option is specified, conversion between *Lotus* and *Excel* formats will be done automatically. Other auto-conversion options are available for most of the major software packages.

The other "official" connectivity solution was the announcement of a much-rumored technology alliance between Apple and Digital Equip-



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Technology for the 90's? Sneaker Net — the ultimate connectivity solution!

ment Corporation (DEC). Mac-to-DECnet links have been available previously (including products from Technology Concepts, Kinetics and TOPS), but the formal alliance legitimizes the use of Macs as front-end terminals on large networks based on DEC's VAX mainframe computers. The announcement outlined plans for everything from distributed applications, file sharing, document interchange and terminal emulation to network management, but no imminent products were announced at the show. (However, a certain *MacUser* editor will now be able to unleash her arsenal of DEC puns in headlines: collect them all.)

Third-party connectivity solutions displayed a wide range of ingenuity. *SoftPC,* a $595 software-only PC emulation program for the Mac II from Insignia Solutions, garnered a lot of interest; the product is supposed to be shipping by the time you read this. PerfecTEK introduced two MS-DOS co-processor boards for the Mac Plus and SE, priced at $995 and $1095, respectively.

For Mac-to-Mac connectivity, La Cie was showing *SilverServer* (hmmm...why does that name sound familiar?), a disk and modem server that lets Macs at several locations (at home and at work, for example) access each other's hard drives or file servers. *Liason,* software from Infosphere, also lets you dial up a remote AppleTalk network to access *AppleShare,* laser printers and send Email. TeleNode from DataSpace is a hardware solution that accomplishes the same tasks.

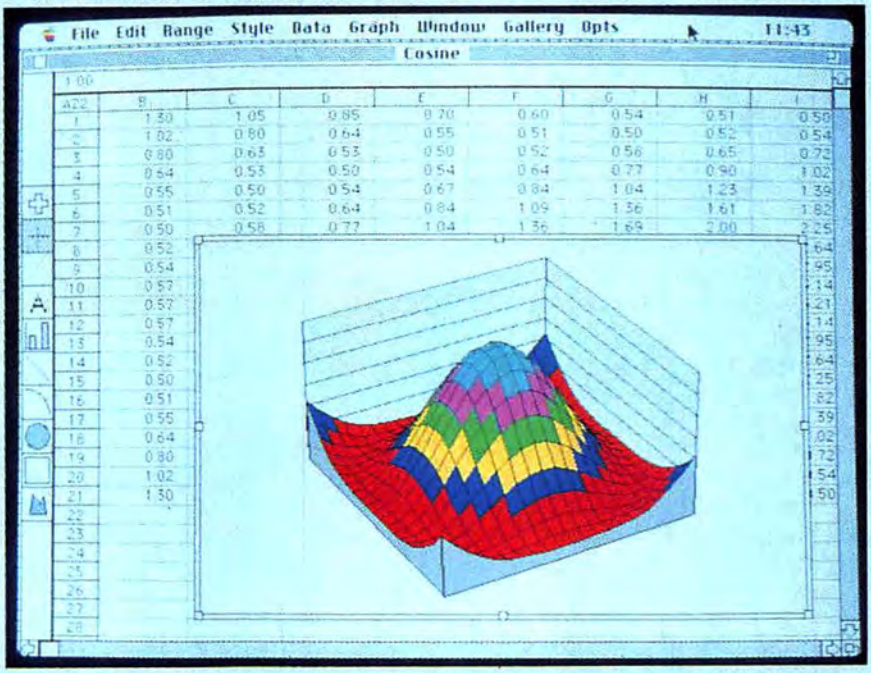
Several Mac-to-mainframe connections and AppleTalk bridges were on display. But the simplest connectivity solution came from Magic Software. For $1.95, you can get 10 Sneaker Net diskette labels. Sneaker Net is compatible with all Macs and includes a unique data management system that requires only the use of a simple writing utensil.

If accounting applications are a test of the Mac's claim to the title "real computer," then Macworld Expo settled that dispute once and for all. Accounting programs were so numerous that a CPA would've had trouble keeping track of them. The number of CAD packages was staggering — as was their price range: $2000 and up. We've come a long way from *MacPaint.*

THE UNREAL

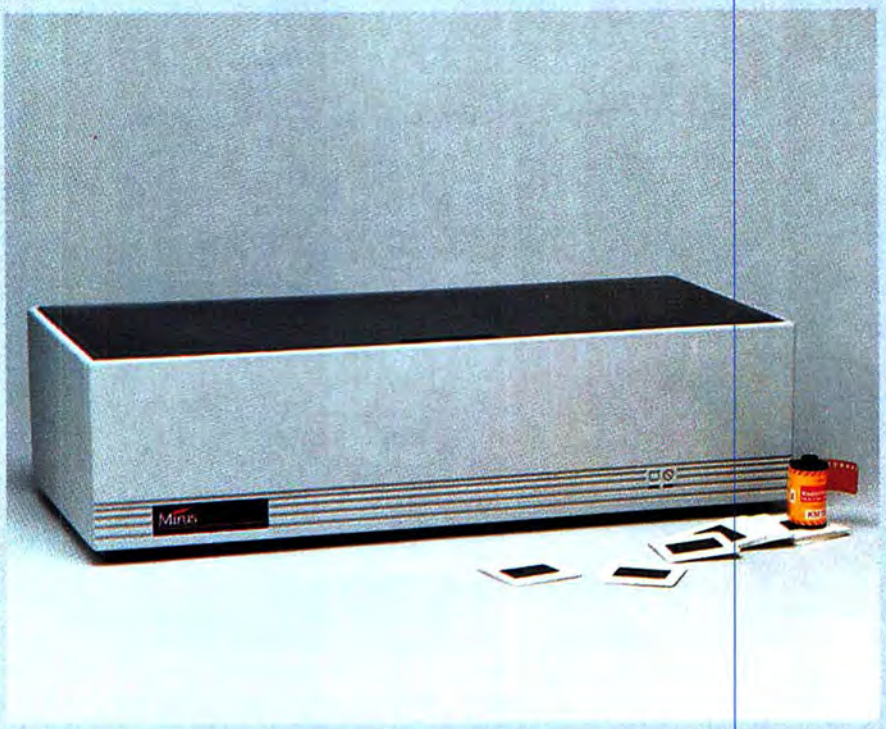
A spate of "2nd quarter 88" releases were announced. Easily the most hyped unreal product was *Wingz,* an integrated spreadsheet from Innovative Software, which had the glitziest booth on the floor — the lines around which accounted for some of the difficulty in navigating that end of the hall. Inside the *Wingz* "Time Shuttle," viewers watched a multi-media presentation starring Leonard Nimoy, who described a new billion-cell spreadsheet that would take you where no spreadsheet has gone before. The simplest way to describe it is to say that it's kind of like what *Excel* might be like in *HyperCard.* In any case, watch for *Wingz* by summertime. If the product doesn't ship by then, they could always just release the video. (Or the jumpsuits.)

Other as-yet unreal products included Cricket Software's *Cricket Paint,* a black and white paint program that can treat shapes as both



Somehow it's just not the same without Leonard Nimoy — a sample from Innovative Software's *Wingz,* an as-yet unreleased integrated spreadsheet.

It's a Mac, Mac, Mac, Mac World



Mirus' FilmPrinter can shoot 35mm slides from both Paint and PICT documents.

objects and bit maps. It's also scheduled for release this summer. *Digital Darkroom,* due in April from Silicon Beach Software, does the same thing in gray scale. On the hardware side, many fax modems were shown, but none were available. Also on display was the Mirus FilmPrinter, which shoots 35mm slides from both Paint and PICT documents. Mirus wants a hefty $6000 for its technology.

AND THE REALLY UNREAL

One trend that needs to be stopped before it gets going is the selling of beta software. In the past, testers have gotten the program free when it is released. Now software publishers like WordPerfect are trying to imply that they're doing users a favor by making them pay for the "privilege" of testing. WordPerfect calls it betaware and is hawking its bug-ridden program for $99 instead of $499 for the final version. Company spokesmen said an upgrade to version 1.0 will be free. In the same vein, Ann Arbor Softworks is sending out what it calls "pre-release" versions of *FullWrite Professional* to people who preordered it. But this "gift" doesn't mean disgruntled consumers won't be able to get their money back from the company, according to Scott Wiener of Ann Arbor.

In the realm of the just plain strange, Casica introduced a collection of wood cases you can place over, around and on top of your Macs, in case the computers clash with your decor. These walnut, mahogany, cherry, oak and black plastic beauties start at a mere $349.

Some attendees were understandably confused by the Buick Motors booth until they noticed the Macs around the two-door sports coupe. On the screen was an interactive presentation product showing the features of Buick's 1988 models. The disk, created by The SoftAd Group, will be available free from Buick.

But without doubt, the most bizarre booth at the show belonged to Laser Charge, a firm that sells dealer licenses in the toner cartridge recharging business. Their booth featured a spit-roasted cartridge rotating over fake coals, and their brochure read like a cross between a tea time movie correspondence school commercial and one of those ads telling kids how much money they can make by selling *Grit.* (Has anybody actually ever *seen* a copy of *Grit*?)

That wasn't the only alternate reality on the show floor. Saint $ilicon (a.k.a. comedian Jeffrey Armstrong), replete with a ROM chip attached to his forehead, wandered the aisles as he proselytized his message — Has your data been SAVED? — and hawked his book, *The Binary Bible.*

Macworld Expo showed that the Mac has penetrated the boardroom (using desktop publishing as, to borrow a phrase from Apple's V.P. of Charisma, Jean-Louis Gassée, a "Trojan niche") and that the Mac II has proved itself as a competitive workstation. But it also showed that the Mac was still just as capable of generating oohs and aahs as ever and that four days of crowds, aggravation, missed appointments, no food, too much food, betaware and no sleep is still an event not to be missed.

FEATURES EDITOR JON ZILBER MET THE DUMPLE OF HIS DREAMS AT THE MACWORLD EXPO AND HASN'T BEEN HEARD FROM SINCE.

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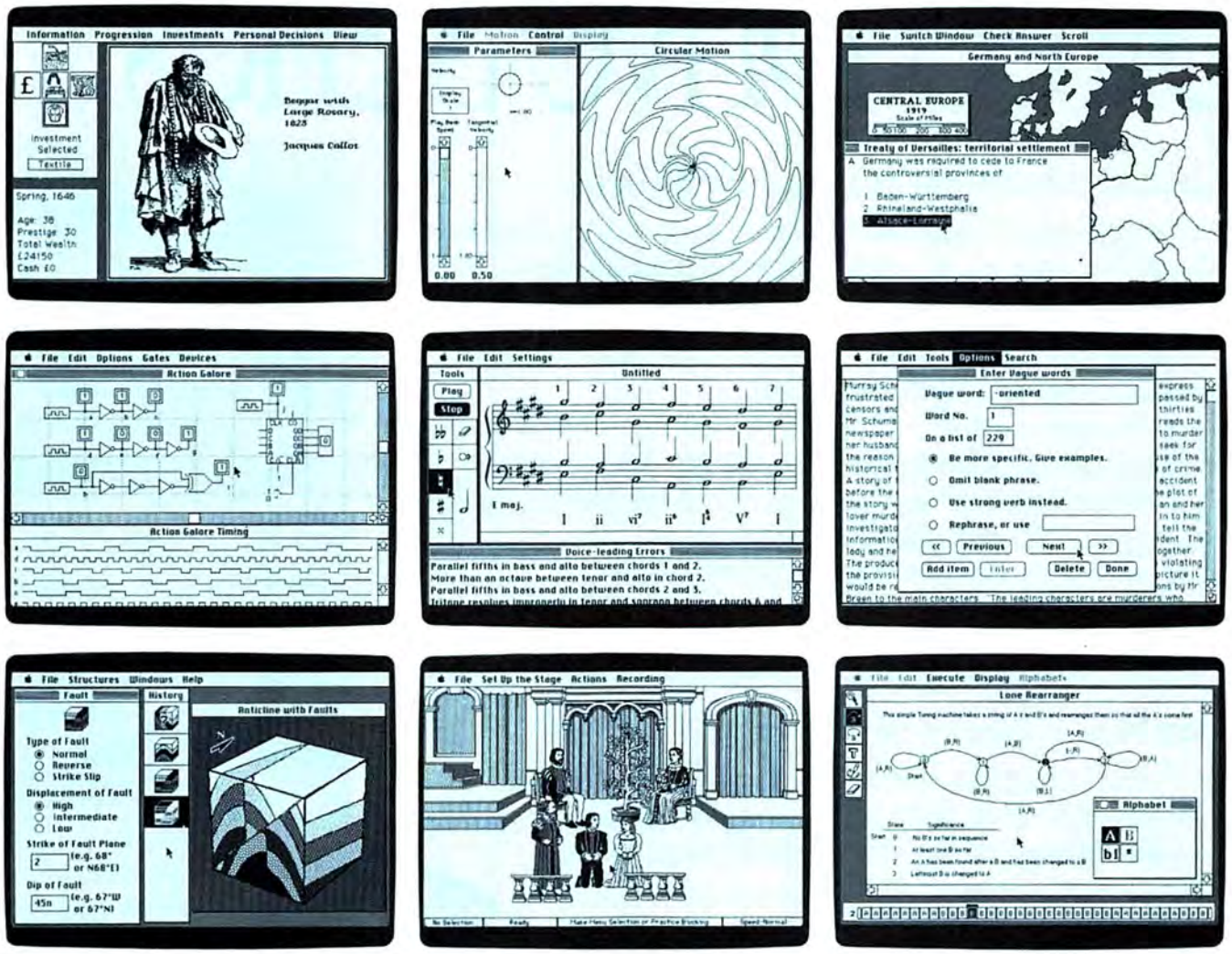
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Access Time		
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By Design

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IT'S MORNING AND MY PROGRAM'S flow chart is spread over the table. The hash mark is lined up with the decision block. Five pages have passed since I discovered the last flaw in logic that required moving an icon to a different page. After nine attempts this diagram is going to be it. The phone rings and I reach to answer it. My morning coffee pours all over the diagram. There is nothing more logical than coffee on a flow chart.

Many of my flow charts meet this fate from coffee, tea or soft drinks, but in 1987 I found a better solution to writing out flow charts by hand. *Design* 1.0 not only let me reprint ruined flow charts, I could also produce legible and concisely structured charts. In August I received *Design* 2.0.

Design is a flow chart program that captures the flow chart paradigm and grows past it. The best characterization of *Design* is that of an environment for linking ideas, tracing thoughts, diagramming programs, prototyping systems, drawing pictures, writing logic trees and outlining projects. *Design* is one of those programs you don't need until you have it. And once you have it, just let someone try to take it away.

THE OBJECT OF CONNECTIONS

At the heart of *Design* lies the flow chart. But this is not like any flow chart you have used before. There are no icons for circles, squares, documents, decision blocks or on-line storage. In fact, when you first initiate the program, you are greeted by a lonely menu bar, a meaningless status bar and an empty desktop. But that's only the beginning.

Selecting NEW from the File menu opens a document. Unlike *MacDraw, Design* documents have no palette of graphic tools along the side of the document. The *Design* tools are menu driven, which leaves the working surface very tidy.

Design's menus contain many shapes familiar to *MacDraw* or *MacDraft* users, but there are a few improvements. The standard box, rounded box, ellipse (circle) and polygon are joined by regular polygons and wedges.

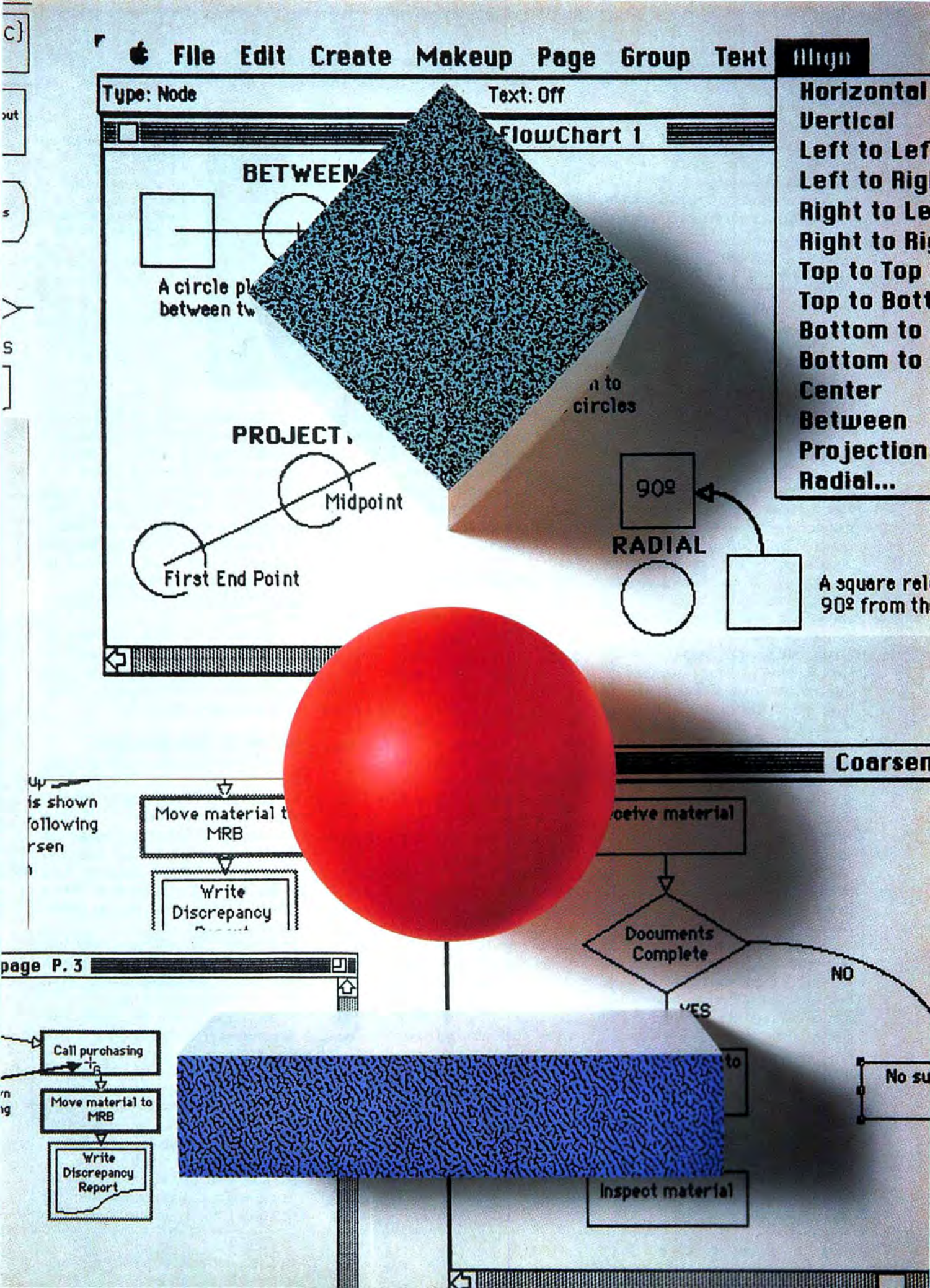
Many of the features of *Design* are not readily apparent. This is a sophisticated program. Objects are drawn by selecting the appropriate tool from the Create menu. After selecting a tool the cursor changes to reflect the object you have chosen to draw. Clicking in the working area creates that image. Hold down the mouse button to stretch and lengthen the image. Images of the current selection type may continue to be drawn until a menu is selected or you type COMMAND-PERIOD.

But this is merely the primitive drawing ability of *Design*. There are many extras. Two of the selections in the Create menu change the default shape of wedges and polygons. By changing the values you have full control over the start angle and end angle of the wedge, the number of sides on a regular polygon and whether the vertex of a regular polygon will be above the center or not. In addition to these controls, the Page menu contains defaults for the height and width of boxes and ellipses, (this includes rounded boxes and wedges) and the curvature of the rounded box. This degree of control makes *Design* a flexible drawing program.

Drawing, however, is not *Design*'s primary design. *Design* is intended to be a graphic logic tool. And it is. The top item in the Create menu is the CONNECTOR. Drawing a CONNECTOR makes not only a graphic link between primary objects, but a logical link as well. *Design* keeps track of this link as objects are moved about on a page. Connectors also have a variety of graphic options to spruce up the look of a document. They can be straight, curved, curved on the side or multi-segmented straight and curved. Arrowheads and text boxes can even be adjusted for height and width. Multi-segment curves make

BY DANIEL W. RASMUS

GARY BUSS


File Edit Create Makeup Page Group Text Align
Type: Node
Text: Off
FlowChart 1
BETWEEN
A circle pl
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circles
PROJECT
Midpoint
First End Point
90º
RADIAL
A square rel
90º from th
Horizontal
Vertical
Left to Lef
Left to Rig
Right to Le
Right to Ri
Top to Top
Top to Bott
Bottom to
Bottom to
Center
Between
Projection
Radial...
Coarsen
is shown
following
rsen
Move material t
MRB
Write
Discrepancy
ceive material
Dooument
Complete
NO
page P. 3
Call purchasing
Move material to
MRB
Write
Discrepancy
Report
Inspect material
No su

an impressive showing next to old, hand-drawn flow charts. Because connectors are treated as logic elements and not as graphic elements, you cannot connect connectors to connectors.

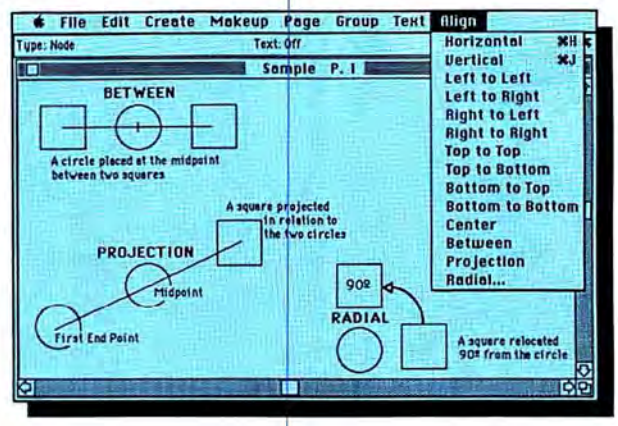
All of the options listed so far can be applied to the current object, a group of objects or to the current objects and all future objects. *Design* allows you to customize preferences on a document-by-document basis.

The *Design* way of looking at groups of objects also differs from other object-oriented drawing programs. The default selection tool allows the user to select objects with a standard selection rectangle. *Design* has two ways of adding and subtracting objects from a group. The first way is good old Shift-clicking. The second way is using ADD or SUBTRACT. When a group is active (all the objects are outlined in gray) selecting ADD or SUBTRACT and drawing a selection rectangle adds or subtracts any objects that fall within the rectangle.

DUPLICATE and SPREAD in the Group menu give the flow chart designer a new sense of control over the look of a document. DUPLICATE makes a copy of a group of one or more objects. If a group of boxes is thrown down haphazardly, dragging a box to each extreme and selecting SPREAD will set all boxes an equal distance apart along a vertical or horizontal line. If there is not enough room to spread the objects the display will be unaffected. Page layout connoisseurs might like to see SPREAD spread to programs like *Ready, Set, Go!* and *PageMaker*.

Design does not just offer horizontal, vertical and center alignments — *Design*'s Align menu also implements seven different edge alignments, a way of placing an object between two objects, a projection function that places objects along an imaginary line projecting through two objects and a way to place objects at specific angles from each other without changing the distance.

Design has all the power of an object-oriented drawing program with the noticeable exception of a line tool. Lines can be simulated by drawing arrowless connectors to hidden boxes or with very thin boxes, but this is too clumsy for a program as well conceived as *Design*. Aside from that, people using *Design* for flow charting or arranging graphic thoughts should find no lack of options to create structured and attractive graphics.



***Design*'s assortment of alignment commands is the envy of *MacDraw* users. BETWEEN, RADIAL and PROJECTION are powerful enticements to use *Design* as a drawing tool.**

FURTHER OBJECTIONS

Creating objects and aligning them is the first level of expertise in *Design*. There is still more. This program seems to descend into the depths of its own structure like an adventure game knight. Each level brings new rewards. The Create menu gives you drawing capabilities that are enhanced by the Align menu. A concert of Create and Align drew some pretty wonderful graphics. But what if you made mistakes? The program was designed to handle that problem with the Makeup menu.

Makeup's SELECT function is very useful for selecting an object out of a mass of other objects. It allows you to see objects flash as your cursor moves over them. When the desired object flashes, a click on the mouse selects it. Other handy tools in the Makeup menu include ADJUST for stretching and reshaping an object even in text mode, DRAG for moving objects while not in their vicinity and for aligning text in an object, DISPLACE for moving the current object the same distance as your last move, MOVE TO for transporting selected objects to new places in the document, MERGE for merging objects and their text, and CHANGE SHAPE for turning circles into boxes and wedges into polygons.

The Create menu includes a region command for creating areas of logically connected nodes. A typical region might be a Save dialog box with Save and Cancel buttons. Since the Save and Cancel buttons are subordinate to the dialog box, they can be made regions of the dialog box and are affected by all actions on it. Makeup's substructure commands allow a region's detail to be hidden or exposed.

There are so many functions in *Design* that help you make your flow chart turn somersaults, the only problem is remembering that a function exists and where.

EDITING THE PREGNANT PAUSE

Creating attractive graphics is not the only requirement for flow chart makers. Flow charts usually need titles or descriptive text.

While creating objects *Design* is in the object mode; to enter text, you must select TEXT ON from the Text menu or type COMMAND-T. When you click on an object in text mode, the object becomes a miniature word processing document, complete with scroll bars. Full text editing is supported, including Find, Find Next and Find Beginning.

The Create menu includes a text-oriented command called LABEL, which places an insertion point on the screen for the entry of titles or descriptions. Labels do not support word wrap and are unaffected by the fill or layering effects available to objects. Labels are labels.

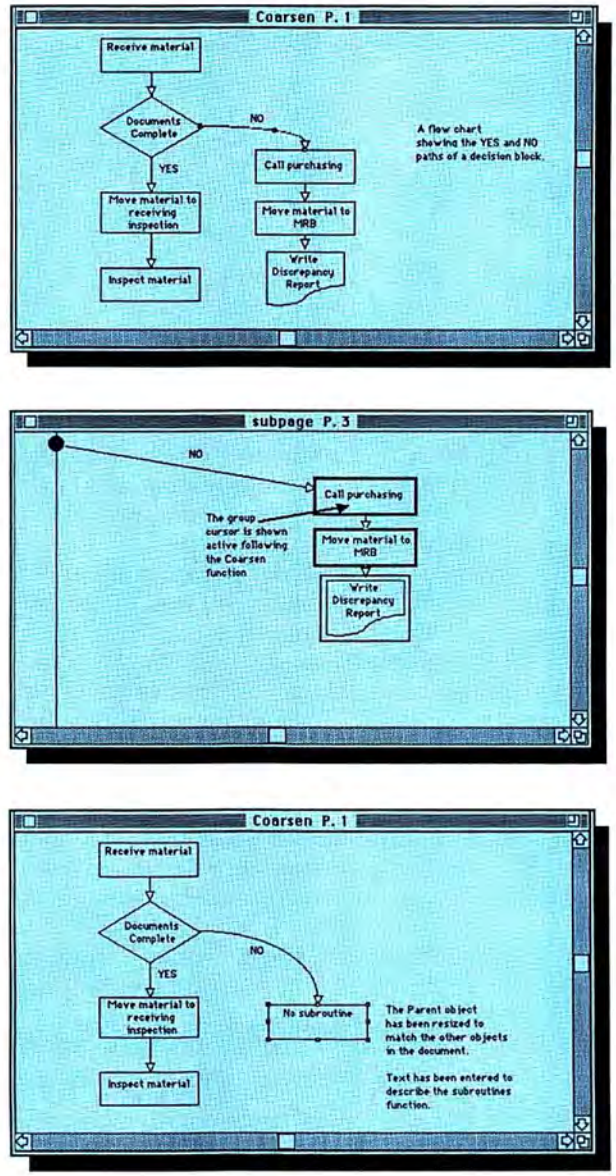
Design handles text attributes differently than many familiar Macintosh programs, but it doesn't impair the user's ability to enter informa-

tion. Formatting, as in *MacDraw,* is restricted to individual labels or objects. You cannot mix styles or sizes of text. Groups of text or objects can be changed if text is turned on during a group operation (perhaps to standardize a typeface or size).

All standard text formats (bold, italic, underline and so on) are included, along with center, right and left justifications. Text operations may be restricted to the current object or may become the default style for future objects.

Like everything else in *Design,* the FIND function is full of possibilities. You can look in a single object, an object and its substructure, a single page or a complete document. *Design* even finds words across hypertext links.

Text handling is well implemented in *Design.* Although individual word or character formatting is not supported, most flow charts don't require this ability. Auto scrolling while selecting text in an object would also be desirable. But *Design*'s other talents make it easy to forget that you can't make a single word bold or drag through the text in an object.



This series of screens shows the structuring of a *Design* hierarchy. The initial flow chart has routines that answer both the YES and NO decision paths in detail. By selecting the NO path and choosing COARSEN, the NO decision block routine has been moved to a separate detail page subordinate to the original or Parent object. In the final view the Parent object is commented and the overview flow chart is complete. By selecting the NO SUBROUTINE box and choosing CHILD from the Page menu, you'll be whisked to the detail subpage.

METAPHYSICAL LEAPS

Hypertext is one of those abilities that makes you forget *Design*'s text format shortcomings. Since its introduction on the Macintosh by OWL International, hypertext has appeared in expert system shells, *HyperCard,* spell checkers and now flow charting programs. *Design*'s hypertext function is not as powerful as OWL's *Guide,* but it is perfectly matched to the functions required in *Design.*

The hypertext button in *Design* is called the tracer. You create tracers by selecting text in an object and choosing COARSEN from the Group menu. A numbered reference is created where the text once resided and a new object appears that contains the selected text. You can transfer this new object to another portion of the flow chart or to another page.

One of the enhancements that hypertext has over regular text is in the SAVE TEXT option in the File menu. When a normal object is selected, its text can be saved as an ASCII file. When an object with hypertext tracers is saved as text, all the tracers are found, wherever they may be, and that text is placed into the ASCII file. For programmers and analysts this can contribute a graphic, hierarchical structure that easily translates flow charts into flat files with nested loops written to their appropriate positions.

The hypertext function contributes significantly to *Design*'s output functionality. On-screen and interface performance would improve if Meta Software would consider adding editable tracers. The number scheme currently used may be effective for programmers, but analysts creating prototypes or demonstrations would benefit from a tracer that said something about its child text.

PAGING ALL PAGES

Each window in *Design* is considered a page. Pages may be reduced to 25 percent of their normal view or to a total of 400 percent larger than normal. Borders can be turned on, off or resized. Choosing SHOW PAGE from the Page menu displays a miniature of your current page.

Design pages themselves represent the hierarchy of objects and text they contain. COARSEN lets you move portions of text to new positions in the hierarchy. For example, if you dia-

gram a program's flow and show all the detail of an IF statement on the same page, the chart may become cluttered and unreadable.

By using COARSEN you can select the portion of the flow chart that contains a subroutine and move it to a child page. A single box remains that can be used to describe the subroutine. Selecting a parent object and invoking CHILD from the Page menu transports you to the page that contains the child's structure (selecting PARENT from the child page will return you to the parent object). If you ever wish to resurrect the original diagram, selecting REFINE moves all the flow charts from the child pages back to the parent. COARSEN allows the user to structure a flow chart's lower levels, and could be used as an on-line prototyping system. The CHILD and PARENT functions can be used to walk through a program flow, simulate screen formats and dialog boxes or animate a procedure.

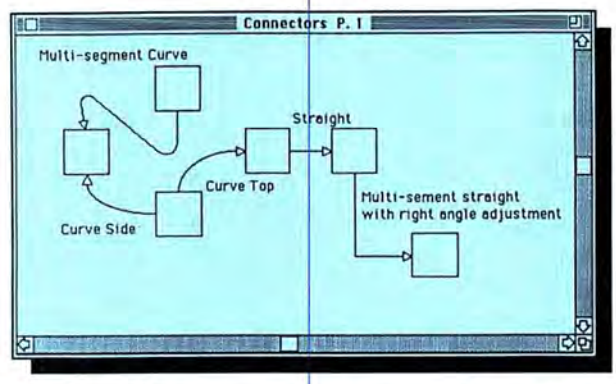
Maneuvering through a *Design* document is accomplished with PAGE STRUCTURE, which is not a window menu, but a new way of viewing a document.

PAGE STRUCTURE displays a window with all the pages and their relationships clearly marked. It may be displayed in either graphic or outline form. If you have named your windows using the PAGE ATTRIBUTES command, the names of the windows appear for easy reference. By clicking on a page name or button, *Design* transports you to the page. This screen is also used when selecting a destination for an object using MOVE TO.

The Page menu is an excellent fit to the texture of *Design*. Options abound, but they are never difficult to figure out and always work flawlessly.

FURTHER PAGINATIONS

And now for a real treat. When we explored the object creation portion of the program, it was noted that *Design* did not have tool palettes. Like many other areas of *Design*, this was not an omission, but an improvement. Rather than cluttering every document with the same palette, *Design* allows the user to create custom palettes for specific tasks. A flow chart example is provided with the program, but any *Design* object or bit-mapped image can become a member of a *Design* palette.



The number of connector variations makes *Design* output attractive for desktop publishing and management presentations.

To create the palette you simply draw the objects you wish to use and arrange them on a page. I suggest that you arrange the objects in the first reduction view so that using the palette does not consume the display. A completed drawing may be converted to a palette by choosing PAGE ATTRIBUTES and clicking the YES button next to PALETTE PAGE?. Using SAVE PAGE from the File menu allows you to save this palette for use in other *Design* documents. Pages saved using SAVE PAGE can only be recalled while a document is open. New pages added while a palette is displayed do not overlap the palette.

User definable palettes are another example of *Design*'s flexibility. Since you are not tied to specific shapes or forced to redraw objects each time you want them, custom palettes are an additional productivity improvement.

In addition to the palette, two other capabilities need to be mentioned: attachments and PICT output. ATTACH and DETACH allow you to connect objects across pages without changing the structure of a document. ATTACH can be used to connect objects to each other for program or procedure walkthroughs that require non-hypertext leaps. If you want to include *Design* documents in reports or presenta-

Programs, Programmers and Procrastination

One of the last things a programmer wants to do is write external documentation. Most programmers can be persuaded to write a few comments in the source code, but writing system specifications or drawing a flow chart is like trying to load a CAD/CAM system on a 128K Mac. It doesn't happen often and when it does, it doesn't last for long.

Well, for C, Pascal and other delimited language programmers, *Design* will be a partial answer. The LOAD TEXT command may make flow charting a little less painful.

To load a program into *Design*, programmers should follow these simple steps.

- Create a new page or document.
- Left justify the text.
- Select a small font (Helvetica Narrow 9-point is ideal).
- Select the correct delimiters for your source code from the defaults command ({ } for Pascal) and set the minimum characters per block to "0".
- Choose LOAD TEXT from the File menu.

This procedure loads the source code into a text hierarchy that reflects the structure of the program.

Once these steps have been repeated for all nodes and tracers, the diagram is ready to be cleaned up with *Design*'s graphic tools. Modifications to the text can be saved as source code using the SAVE TEXT command.

Although *Design* is not really a Computer Aided Software Engineering (CASE) tool it has some of the rudimentary functions and can provide an entry level solution to documentation needs. The amount of moving and coarsening within a flow chart may seem monotonous, but it still beats retyping the whole program or drawing the flow chart — heaven forbid — by hand.

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tions, you can save any *Design* page in PICT format using the SAVE PAGE command in the File menu and clicking the PICT file format.

IMPROVING THE DESIGN

Design is a well-thought-out program. Suggestions from users are readily accepted at Meta Software. My own 12-item list submitted for their 1.02 version was answered in 2.0, except for two issues. And I still think those and a few others need to be addressed.

Probably the most annoying shortcoming is UNDO. UNDO only works with Align, Cut, Copy, Paste, Clear or Spread. UNDO should cover all functions. This overhead may detract from the fast graphics, but when I make a mistake I have grown accustomed to having UNDO available.

Stalwart *MacDraw* or *MacDraft* users may find using the CLEANUP command to restore image integrity after enlarging or reducing a page an unnecessary step. But after an inquiry, Meta Software explained that this approach is used to support their 32 bits of image accuracy. By avoiding a CLEANUP during every enlargement, graphic speed can be maintained. Despite the understandable performance issues a CLEANUP function should be performed automatically prior to printing. A garbled screen image is printed if a CLEANUP has not been performed. The addition of actual size or normal view with a built-in CLEANUP might also ameliorate the interface.

Hypertext tracers also need to be improved for clarity. Command keys for some functions like COMMAND-9 and COMMAND-0 may prove difficult for some to reach. The capability to move objects while text is on (perhaps by holding down the Option key to temporarily exit text mode) would also be a welcomed feature.

These, however, are all issues that removed only minor shine from an excellent product. There are few programs today that require a reviewer to reach for problems. I had to reach.

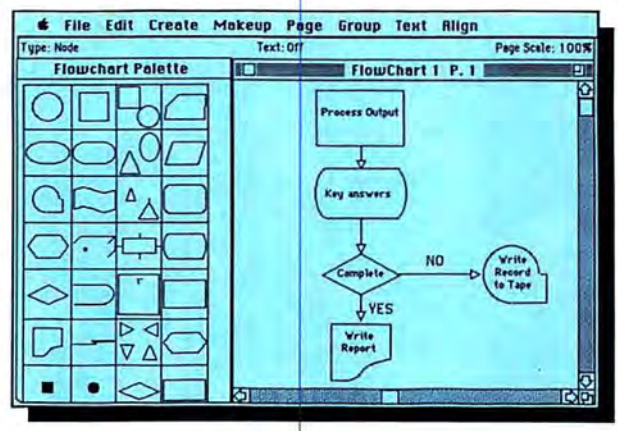
GOING WITH THE FLOW

Design is a program that flickers across my screen almost daily. It is a quality tool for creating flow charts or laying out your thoughts graphically. I sometimes rely on its layout abilities to rough out new form designs or draw pictures.

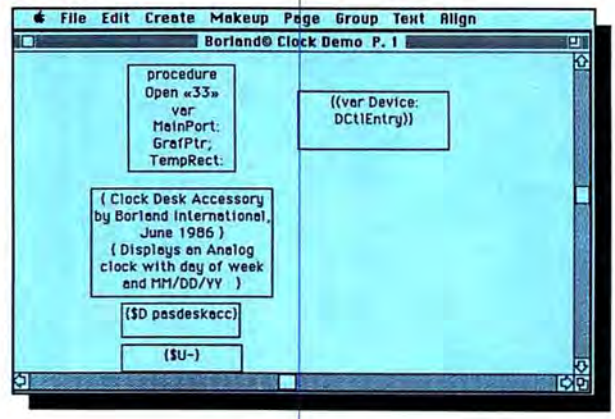
The manual is short and clear with a tutorial that makes you productive quickly. On-screen help is not provided except as guidance from the status bar. Meta Software might consider help screens that display Command-key sequences or make the manual's glossary available.

Support from Meta Software has been prompt and accurate. Meta claims they will continue to improve the program based on user suggestions and internal requirements.

Design is a powerful aid for programmers and systems analysts, and it can also contribute to the productivity of desktop publishers, procedures analysts, knowledge engineers and managers — in fact, anyone interested in seeing how things connect will find *Design* the right tool for the job. *Design* comes highly recommended from a clumsy analyst.



Programmable palettes make customizing *Design* for specific tasks simple. By storing various palettes as *Design* pages the program can be a flow charting system one moment and converted to a semantic network system the next.



This is an example of *Design*'s ability to translate source code into a flow chart. The first four boxes are in order and the box to the right of the main program box is referred to as hypertext tracer 33. Selected text from the main program box can be COARSENED to a new object. This can then be moved with logical relationship intact. The example program is from *Turbo Pascal*.

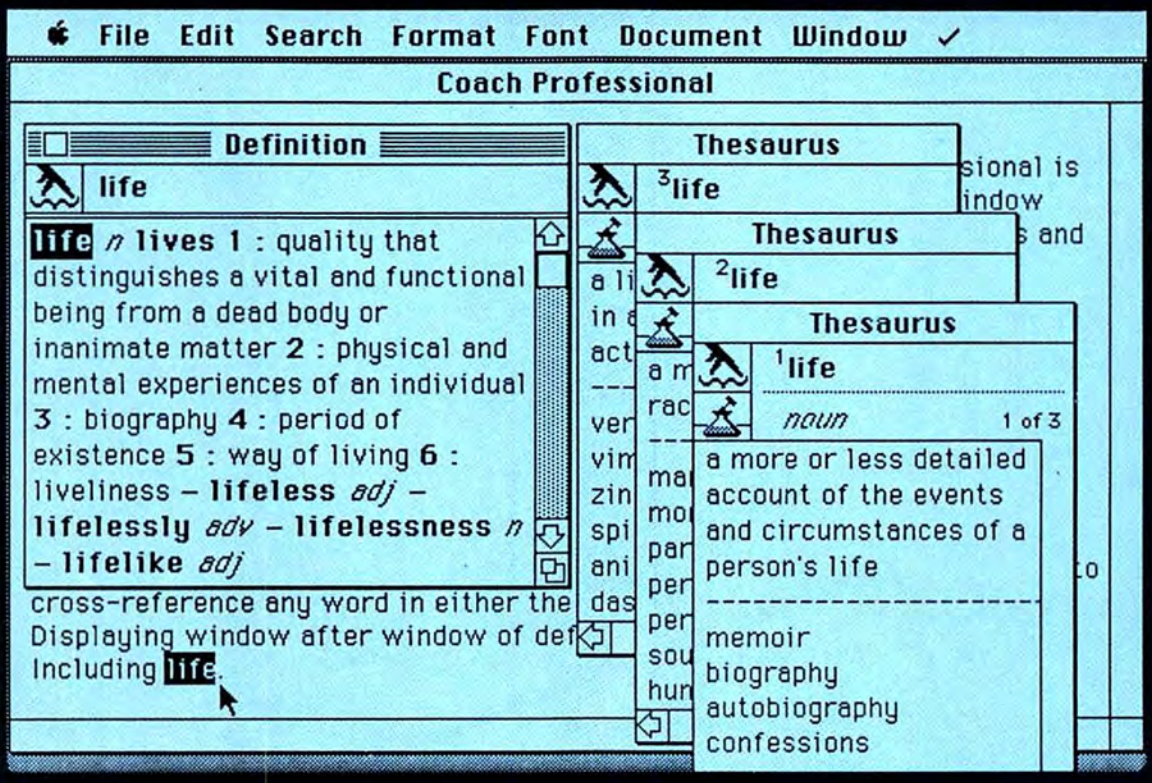
DANIEL W. RASMUS IS A SENIOR POLICIES AND PROCEDURES ANALYST FOR WESTERN DIGITAL CORPORATION'S MANUFACTURING STAFF. HE IS A FREQUENT CONTRIBUTOR TO MANUFACTURING JOURNALS.

MACUSER RATING

Design 2.0 ★★★★½

Follows Mac Interface	■ ■ ■ ■ ◧
Printed Documentation	■ ■ ■ ■ □
On-Screen Help	■ □ □ □ □
Performance	■ ■ ■ ■ ◧
Support	■ ■ ■ ■ ■
Consumer Value	■ ■ ■ ■ ■

Comments: An excellent flow charting system for programmers. Graphically depicts the flow of a process or the relationships between systems or individuals. **Best Feature:** Hierarchical structure and internal tracking of relationships between objects. **Worst Feature:** The inability to move objects while editing text and the lack of text editing in hypertext tracers. **List Price:** $250. Meta Software, 150 CambridgePark Drive, Cambridge, MA 02140. (617) 576-6920. Requires 512K+. Not copy protected.



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TOM UPTON

Me and My Printer

It's half the price and half the weight, but it's still a laser printer. Is GCC's PLP the way to print your personal best?

A LASER PRINTER IS, FOR MANY PEOple, the Holy Grail of computing, but the quest can be an expensive one. However, a new machine, General Computer's Personal LaserPrinter, could make your quest a little easier than Sir Galahad's. Although it has a bit less shine and fewer features than Apple's top of the line units, the PLP also features a much more reasonable price.

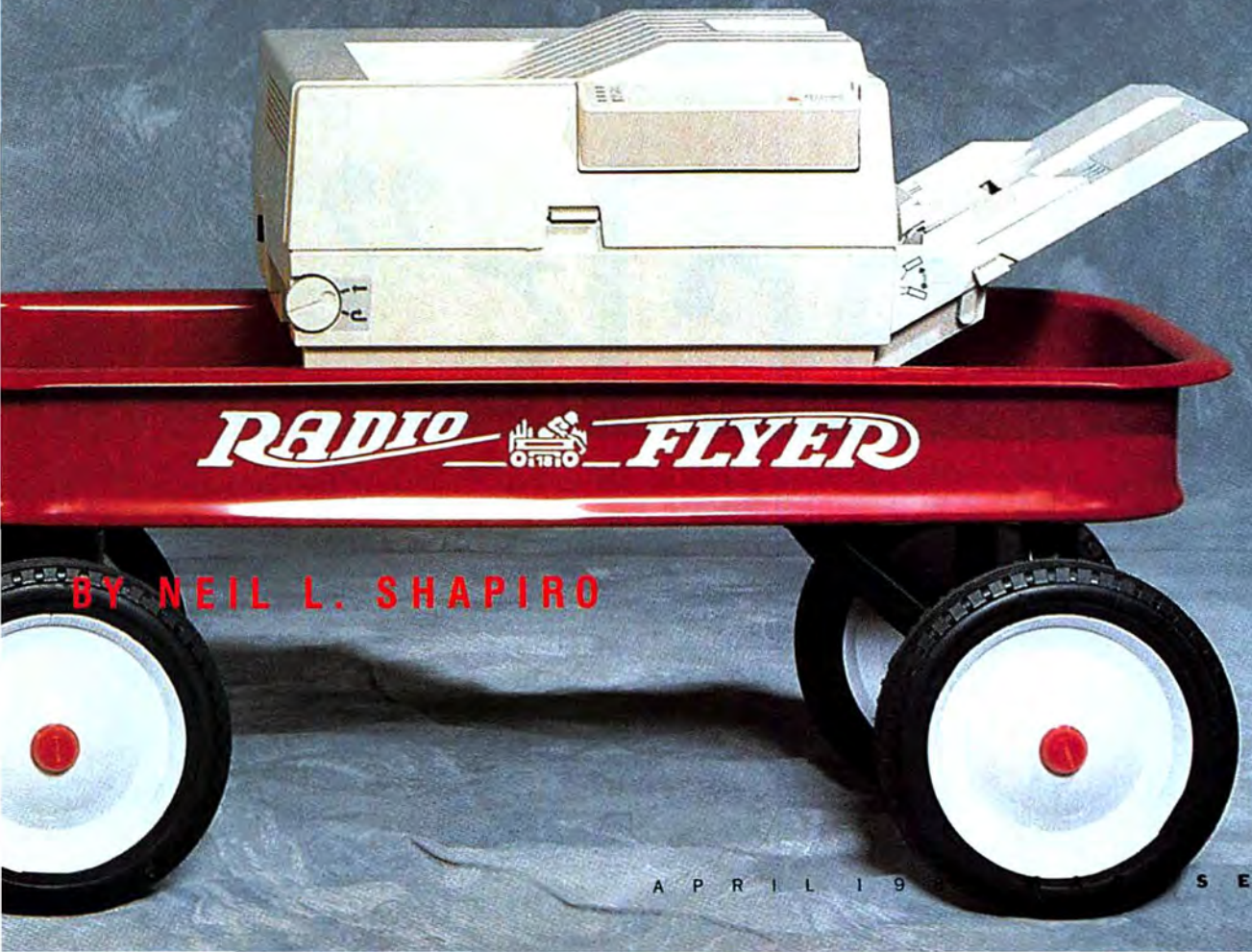
Technically speaking, the PLP is an electrophotographic printing machine using a semiconductor laser. It's based on the Ricoh laser printing engine and is capable of printing at a resolution of 300 X 300 dpi (dots per inch), the same resolution as Apple's LaserWriter.

Practically speaking, is it the way to crisp, clean output without losing too much of the crisp green from your wallet? We've used one extensively now and have put it through its paces.

FOR YOUR EYES ONLY

The PLP isn't made to be networked. It's a "personal" printer, and can't be shared via AppleTalk with other machines. And, again unlike Apple's LaserWriter, this printer does not speak PostScript but uses the Mac's built-in QuickDraw routines and processing power to form the characters it prints.

While assembly was not difficult, neither was it an open-and-shut case of open the box and plug in the unit. New owners had best set aside enough time so you won't feel



BY NEIL L. SHAPIRO

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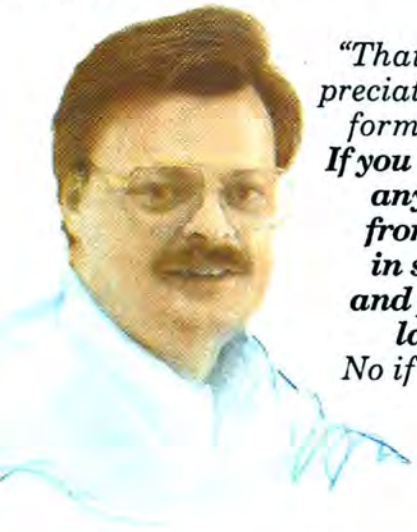
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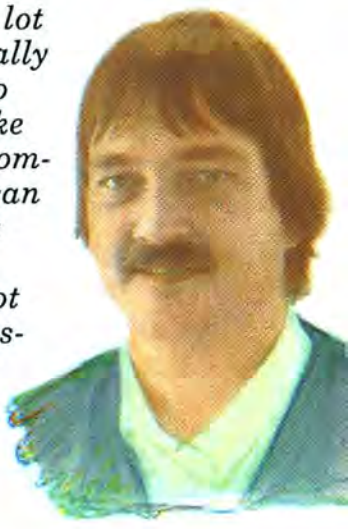
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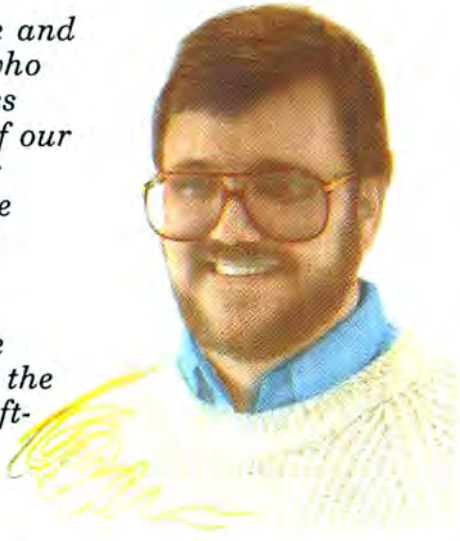
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rushed. Plan on at least an hour to both familiarize yourself with the instructions and parts, and to do the actual assembly.

After unpacking the components from their foam carriers, flip open the top of the printer. If you've ever looked inside a laser printer before, your first reaction will probably be "Where are the guts?" Well, you're about to put them in.

First, the toner cartridge must be installed. Clear and detailed pictures in the manual guide the user on this step, as the cartridge must be carefully positioned. Once positioned, the cartridge is opened so that the toner material is available to the printer. (It is this sardine can-like toner cartridge mechanism which later proved to be the only irksome feature of the machine; more on that below.)

Then the OPC (Organic Photo Conductor) assembly, which contains the main print drum, must be placed into the printer's body. A large, bold-faced warning in the manual states that the photosensitive surface of the drum may be damaged by either sunlight or bright lights. Another warning indicates that the installer should not feel panicked or rushed.

What's the first thing you do when someone says "Don't Panic" (besides reaching for your *Hitchhiker's Guide*)? Well, perhaps a touch of panic is called for, as the OPC drum truly should be treated with some caution.

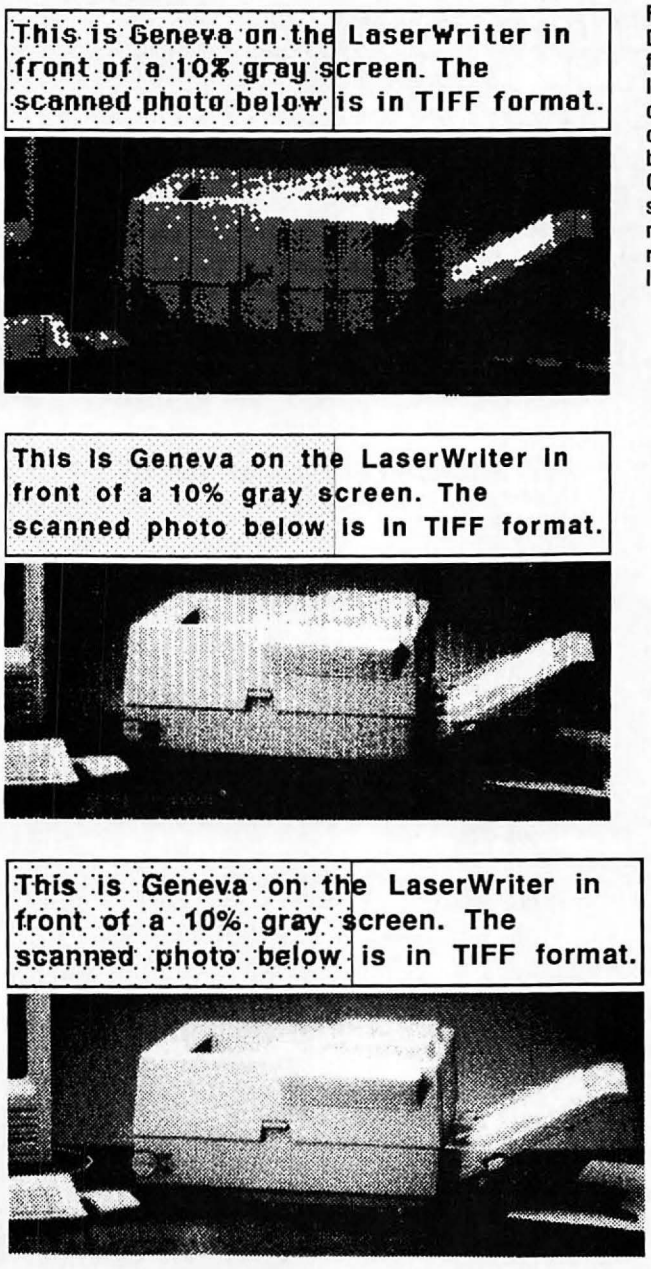
Finally, the printer was together and it only remained to install the paper tray. The tray is a sturdy assemblage with a positionable guide which can handle almost every kind of paper from 4 inches X 8.3 inches to 8.5 inches X 14 inches in size, and from 16 to 24 pounds in weight (34-pound paper can be used if you feed it manually and can find it), with rulings for all standard paper sizes.

The printer connects to a standard SCSI port and uses a standard SCSI cable. Hooking up the cable to the Macintosh was the final hardware step.

A first-time experience with SCSI cabling and terminology can be confusing, what with terminators and ports, internal termination and "devices" to worry about. But the manual shines in this area. Clear and detailed drawings show just about every possible hookup that the user might need.

Installing the software is the quickest part of the set-up. Various files need to be copied onto the user's System disk or into the System folder and into the *System* file itself.

One program, the *PLP Print Manager,* one System icon (print driver), *PLP* and the various font files must be copied over. The way the PLP uses fonts is particularly interesting.



From top to bottom: Draft mode printing is fast and produces ImageWriter-quality output. High quality PLP output features crisp blacks and gray screens. On the LaserWriter, scanned images show more detail, but black regions and screens are less even.

FOND OF FONTS

One set of fonts is placed in the Font File Folder. When the LaserPrinter prints, these are the fonts that the Macintosh's own CPU and QuickDraw ROM routines will interpret. Unlike the Apple LaserWriter, which has a computer brain even more powerful than a Mac Plus and many fonts in ROM, the General Computer printer depends on the Mac for the brainwork and font interpretations.

As a result, printing can be quite a

bit slower, since you've only got one computer on the job, not two. To help make up the difference, one megabyte of RAM and a hard disk are required to use the PLP. (Surprise, surprise! General Computer also makes memory upgrades and hard disks!) On a 512K Mac, a special optional RAM cartridge adapter is also required.

Another set of fonts, called "LaserPrinter Screen Fonts," is installed in the *System* file using Apple's *Font/DA Mover* program. These are fonts that are particularly scaled to both look good on-screen and to be representative of the real printout. This is necessary because the screen's resolution is different from the printer's. Six sets of fonts come with the PLP: Times, Helvetica, Courier, Symbol, Zapf Calligraphic and Swiss Narrow. Additional fonts are also available from General Computer.

Finally pick the PLP icon in the *Chooser* desk accessory, print a test sheet and you're off and running in a way that the ghost of Gutenberg would hardly believe.

UP AND AT IT

Printing from most applications is as easy as selecting PAGE SETUP and then PRINT. The first dialog box, Page Setup, allows for such things as page orientation, reducing or enlarging and three choices that are very important: Substitute Fonts, Smooth Screen Fonts and Smooth Bitmaps.

The Substitute Fonts choice tells the PLP to replace regular screen fonts with high-quality fonts. For example, if the document is written in the regular New York font, with this choice checked, the printout will be automatically done in the high-quality Times font.

Smooth Screen Fonts comes in handy if no high-quality fonts correspond to the font the document is written in. This choice smooths the screen fonts to make them look closer to high-quality fonts. This option is particularly useful with decorative fonts such as Camelot and Hollywood. The Smooth Bitmaps option helps when printing out such things as *MacPaint* images.

When printing, the Print dialog box offers several more options. The Preview option is sort of a WYSIWYG translator: It "prints" your document in reduced size on-screen exactly as the printed output will look — usually. (See the sidebar "Reconcilable Differences" for a discussion of printing problems, pitfalls and workarounds.) The cursor changes to a magnifying glass icon and any portion of the on-screen representation can be zoomed in on for a closer look.

There is also a choice to print out either now or later. If you choose to print later, the document is filed in a "Spool Folder" and the *PLP Print Manager* can be used later to print any or all of the "spooled" documents. If there is not enough memo-

This is the Geneva font. It should be of high quality only if you have selected "Substitute Fonts."

This is the Geneva font. It should be of high quality only if you have selected "Substitute Fonts."

This is the Times font. It should be of high quality.**

This is the Helvetica font. It should be of high quality.**

This is the Courier font. It should be of high quality.**

This is the Zapf Calligraphic font. It should be of high quality.**

This is the Symbol font. It should be of high quality.**

If you mix and match PLP and non-PLP fonts on-screen, you have several options at printing time. With the Substitute Fonts option selected (as in the first example), on-screen Geneva (not a PLP font) prints as PLP Helvetica. In the second example, with Substitute Fonts not selected, a bit-mapped representation of the Geneva font is constructed. The remaining examples are all PLP fonts.

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Me and My Printer

ry to print now, the documents will also be spooled.

HURRY UP AND WAIT

Sometimes you have to wait for the *Print Manager* to do a fair amount of processing (possibly even printing the first few pages) before it tells you that there won't be enough memory to print the entire document. So if you don't need to see your output right away, you can save yourself some frustration by spooling all the documents you're working on and printing them all at once later on (while you go to lunch). The spooler also keeps copies of all the documents you've printed (until you delete them), which makes it easy to make reprints of an earlier draft or previous project.

If you choose not to spool, an "Out of Memory" message will pop up more than occasionally on an unenhanced Plus or SE. This is foreshadowed by the labels on the buttons in the Print dialog box, which offer the following Hobson's choice: "Now, if memory permits" or "Later." Unless you're printing short, simple documents, these "options" translate into "spool, if you know what's good for you."

On the other hand, printing throughput can be increased if you have a Mac II or SE with an accelerator board. (For a review of accelerator boards, see the March '87 *MacUser* Labs Report. The money you save on the printer just might pay for the accelerator board or for the difference in price between an SE and a Mac II.)

If you need fast turnaround of your documents and can sacrifice print quality, the PLP offers an extremely fast draft mode that produces roughly ImageWriter-quality output. This is especially useful in page layout programs where print times can get out of hand, but where it's also often helpful to see several printed iterations of the design you're working on.

For example, printing a draft of a page layout that included a TIFF graphic, several fonts and a few *MacPaint* images took just over a minute, compared with over 8½ minutes for a high-quality print.

Once you finally print, the normal paper flow from the PLP leaves your output in ascending page order, face down in the bin on top of the printer. If the application prints out pages in reverse order, you can reverse the reversal by flipping a switch that lets you collate your output backwards and face up on your printer table.

FEED ME

Status lights and dialog boxes keep you informed of the PLP's every maintenance need. If you think of keeping the paper tray filled as corresponding to keeping your car's gas tank filled, changing the toner cartridge is like changing the oil. You'll have to change it about every 1500 pages printed, although this varies depending on the average amount of black on your pages. (The first cartridge will only last about half as long.)

Continuing the car maintenance analogy, changing the OPC is like overhauling the engine (needed about every 20,000 pages). When it's time, a dialog box appears to tell you whether you need to replace the whole shebang or just the cleaning assembly.

UP CLOSE AND PERSONAL

Overall, the General Computer LaserPrinter receives high marks, with but one caveat. First, the kudos. When I first hooked up this printer I was skeptical of a laser printer that used QuickDraw rather than PostScript. Could it really compete in the world of desktop publishing where perfection is often not just a goal but a moral imperative? I've used the printer extensively with many different publishing programs and using many different effects. I have never felt a lack due to its QuickDraw-only capability. It does, indeed, show some harshness of line in very intricate object-oriented graphics, but this would only be likely to affect the most power-user-oriented CAD systems. For such things as office reports, everyday graphics and general daily use the output is simply superb. Letters are always crisp and clean, evenly shaded and blacks are truly black.

But no review is complete without



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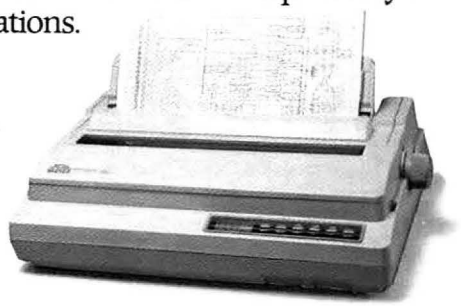
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Reconcilable Differences

Since the PLP doesn't understand PostScript (or other non-QuickDraw printer commands), some features in some programs require workarounds to get your output to match your expectations, and some features and programs won't work at all. But most programs work fine, if you're willing to avoid one or two hazardous situations or are willing to make, as Buffy and Hildy used to say, one small adjustment (or two).

The workarounds (many of which are fully explained in a bulletin from General Computer that comes with the PLP) range from minor to major to bizarre. For example, in the minor-irritation-that-you-can-live-with category, Headers and Footers will not print when using legal-size paper in *Excel*. Another minor problem with an easy workaround: Pages in *SuperPaint* must be printed at 96 percent reduction. Another: If you change your Page Setup in *Ready, Set, Go!* 4 to landscape orientation, the PLP still prints the page in portrait orientation until you also change the Printer Setup.

In the major headache department, spooled documents in some applications (including *Word* and *Business FileVision*) are all given the same name, although their spooling times are date-stamped correctly. So the only way to distinguish among several spooled documents is to manually keep track of the time and date when you sent each document to the spooler.

In the category of bizarre workarounds, the PLP prints the square of the number of copies requested in *PageMaker, Double Helix* and *More* Print dialogs. This poses no problem if you only need one copy, since the square of one is one. And it will also print the correct number of copies if you shunt the output to the PLP spooler, and indicate the correct number of copies in the spooler's Set Options dialog. (And if the number of copies you want just happens to be a perfect square, you could always just enter the square root of the actual number you want.)

The easiest software workaround comes from Aldus: they've developed a version of *PageMaker* (2.0a) designed for the PLP. A card good for a free upgrade to 2.0a for registered *PageMaker* owners is included with the PLP documentation. (Unfortunately, *PageMaker* 2.0a still requires some workarounds and can't print PostScript-based effects like shadowed text.)

The worst surprises come from *Illustrator, Cricket Draw, XPress* and other PostScript-intensive applications, which can produce completely unpredictable results; you probably won't get much useful output from these programs on the PLP. A few programs will not print at all with the PLP. These include *Insight 1.02, Microphone* 1.0, *OverVue* 2.1a and the 4.10 version of Great Plains' Accounting Series.

Based on the early success of the PLP in the marketplace, it's likely that more third-party software publishers will endeavor to make their software PLP-compatible, or will make special versions available to PLP owners. And future updates of the PLP software will eliminate some of these bugs and incompatibilities.

General Computer had announced plans to release several upgrade options by the time you read this. *PLP Share* (priced at $499) allows you to network a PLP to multiple users. And a PostScript-compatible PLP (or $1999 board-swap upgrade), which includes two megabytes of expandable RAM, lets you use applications that expect the printer to speak PostScript version 47.

Although it has its share of deficiencies, the PLP also has a few aces up its sleeve. For example, the PLP's Page Preview can sometimes improve on WYSIWYG bugs in an application. In *Ready, Set, Go!* 4, for instance, white text (useful if you want type against a dark background) is displayed transparently on the screen; depending on the font size and style, it won't show up on the screen, even if it's in front of a solid black box. But it does show up in the Preview and it prints out just fine on both the PLP and the LaserWriter. (White text *will* display on the screen if the text box itself has a dark fill pattern.)

In general, the PLP has blacker blacks and more even screens and fills than the LaserWriter, while the LaserWriter wins on fine line art, half-toned graphics and PostScript effects. The PLP fonts (from Bitstream, a newcomer to the Mac market, but a major player in the PC world) are comparable to LaserWriter fonts. Zapf Calligraphic (similar to Palatino on the LaserWriter) is my current font of choice on the PLP. With the addition of General Computer's optional *Fonts Plus* package, the PLP has substitutes for all the LaserWriter Plus fonts, and a few extra ones as well. —*JZ*

something the reviewer would change — in this case, I would completely redesign the toner cartridge. As it is now, the toner cartridge sits vulnerable atop of the interior assemblage. The bottom of the cartridge is open so that gravity can cause the toner material to fall out. The cartridge is held in place only by one weak clamp.

I had a paper jam one day (my fault for not noticing a paper clip) and had to clear the machine. I must have bumped against the toner cartridge. The result, the next time I opened the machine, was an evil cloud of black dust over me, my Mac II, my desk, my office walls, the LaserPrinter and my disposition, as the toner cartridge let go. It was not a cleansing experience that one would cherish forever. It was rather like cleaning up after a thousand monkeys changed a million typewriter ribbons. In the event of even more serious mishaps, servicing and service contracts are available nationwide through Xerox and Okidata service centers. They can help with the machine, but cleaning up after the PLP is still up to you.

Apple's LaserWriter set a high standard against which all other laser printers must be judged. Does the PLP measure up? If you don't need PostScript or networking, if the money you'll save is more important than dealing with workarounds, and if you're able to keep a steady hand with the toner cartridge, the PLP is one little printing engine that can.

NEIL L. SHAPIRO IS MACUSER'S EDITOR-AT-LARGE AND CHIEF SYSOP OF COMPUSERVE'S MICRONETWORKED APPLE USER GROUP (MAUG).

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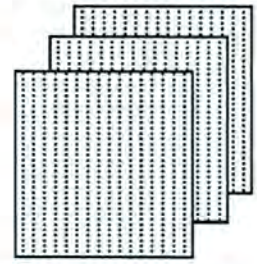
Personal LaserPrinter

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Comments: A non-PostScript, non-networkable laser printer. **Best Feature:** Price. **Worst Features:** Clumsy workarounds required in some applications. Printing can be slow. **List Price:** $1999; Fonts Plus $299. Requires 1 megabyte of RAM and a hard disk. From General Computer, 580 Winter Street, Waltham, MA 02154. (617) 890-0880.

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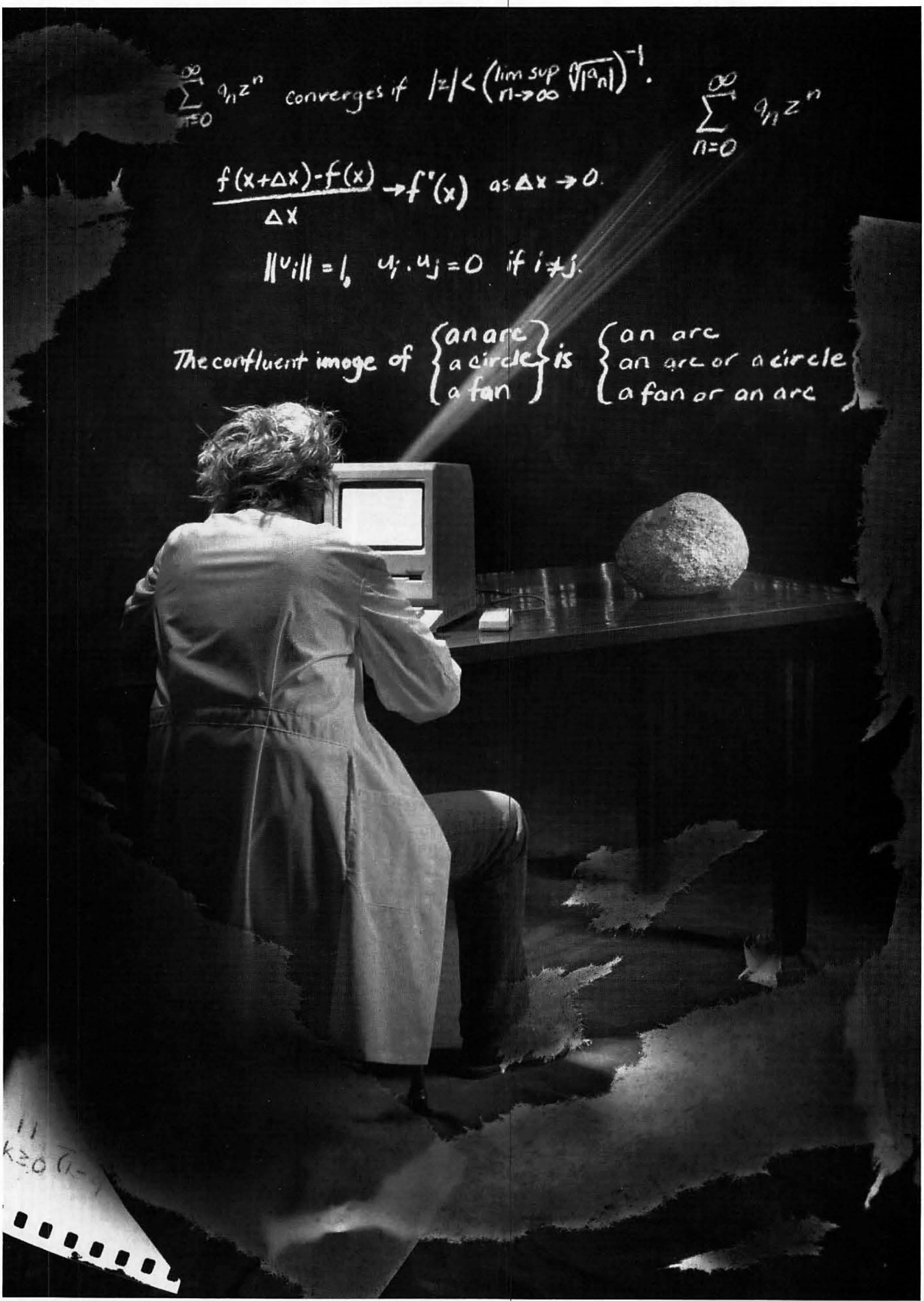
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$\sum_{n=0}^{\infty} a_n z^n$ converges if $|z| < \left(\limsup_{n\to\infty} \sqrt[n]{|a_n|}\right)^{-1}$.
$\sum_{n=0}^{\infty} a_n z^n$
$\frac{f(x+\Delta x)-f(x)}{\Delta x} \to f'(x)$ as $\Delta x \to 0$.
$\|v_i\| = 1$, $v_i \cdot v_j = 0$ if $i \neq j$.
The confluent image of {an arc, a circle, a fan} is {an arc, an arc or a circle, a fan or an arc}

TOM UPTON

Deep in the Heart of TeX

TeX means total typesetting control. And now there are two Mac versions to pick from.

BY GREGORY WASSON

NO, COWBOYS, I'M NOT TALKING DALlas, dogies or a steaming hot bowl of Big Red. And J.R., I don't mean you. But I am talking big — and I do mean BIG — in a number of ways that will become clear as you read through this article.

TeX (pronounced "tech" as in "*tech*nology") is a typesetting language that dates back to the late 1970s. It was originally developed on mainframes in response to the often unmet typographical needs of the academic community — particularly those of mathematicians and other technically minded scholars. TeX is still entrenched in that milieu.

With the growing popularity of desktop publishing (DTP), where Macs still dominate the field, a Mac version of TeX was inevitable. And now there are two — *MacTeX* from FTL Systems and *TeXtures* from Addison-Wesley. The Mac versions of TeX have, like their more established relatives, enough powerful features, including automatic kerning, indexing, formatting, table of contents and footnoting capabilities, to make even the most jaded DTP-er drool. There is nothing in the Macintosh DTP arena that can compete with it. That is no exaggeration. But the power comes at a very steep price.

STICKY BUSINESS

TeX is a coded system of typesetting. The formatting is not done on screen by the click of a menu item, but by inserting the appropriate code before the text.

The files created by TeX are usually called dvi (device independent) files. *MacTeX,* the first Macintosh TeX program, does this automatically; its output files are dvi files. *TeXtures,* the second program, requires its users to create dvi files by using a desk accessory that's included. The purpose in both cases is the same: to create compressed binary code descriptions of pages that can be processed on a wide variety of output devices and by various systems, from mainframe to PC, IBM to Macintosh.

Whatever the format used, the TeX environment is always governed by two basic concepts — boxes and glue. The simplest kind of box is a character from any given font. The basic unit has height, width and depth — a model that should be fa-

CHAPTER 2

The Pool of Tears

"Curiouser and curiouser!"[1] cried Alice (she was so much surprised, that for the moment she quite forgot how to speak good English). "Now I'm opening out like the largest telescope that ever was! Goodbye, feet!" (for when she looked down at her feet, they seemed to be almost out of sight, they were getting so far off). "Oh, my poor little feet, I wonder who will put on your shoes and stockings for you now, dears? I'm sure *I* shan't be able!

[1] A fine, albeit ungrammatical remark, that many a beginning TEX user might exclaim. Courtesy of Mr. L. Carroll.

Alice in TeXland. A sample output page produced by *MacTeX* on the LaserWriter Plus.

$$\frac{\prod I \; et \; X \; \frac{I}{(I - V^{I} XD)} = \sum L \; et \; XD^{X}}{I \; minus \; I \; minus \; X(I - D^{X})}$$

A rare example of higher algebra from the Roman Empire. This comes from the relatively unknown *Liber matematici ridiculosi*, a manuscript recently uncovered at Pompeii in a chamber pot. The astute reader will notice the affected use of Greek, a sure sign of the snob—*n'est-ce pas?* Courtesy of the Museo Pompositatis. (Argumento Falaci, Curatoro)

TeX excels at typesetting mathematical formulas, even when they are drivel from ancient Rome.

miliar to any typesetter. TeX combines these smallest of boxes into larger horizontal boxes, or words. Word boxes are combined into lines. The horizontal boxes are finally joined together on the page, which is itself a kind of large vertical box.

Glue is the "mortar" that holds all of these boxes and the page together. Depending on how the page is initially defined (rag-right, justified, etc.), glue operates differently. It's essentially equivalent to what a program like *PageMaker* would call interline (leading), interword or interletter (kerning) spacing. It shrinks or expands according to how TeX's internal rules or user-defined parameters tell the program to set specific lines of text.

That's it in a nutshell. TeX's approximately 300 control "primitives" and 900 or so predefined control sequences or macros all in one form or another act upon these two basic building blocks. Is TeX really worth the trouble? A look at the two Mac implementations should help you decide.

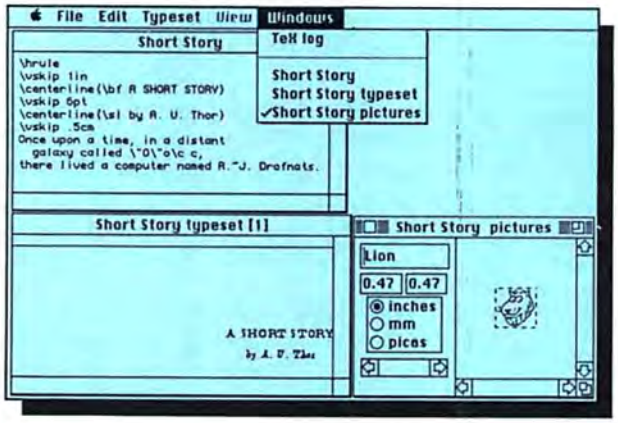
THE ROUGH AND THE SMOOTH

TeXtures, from Addison-Wesley, is the most recent entry in the Macintosh TeX arena, and has a reasonably good Mac "look" to it — once you get past the installation procedure. It comes on two 400K and four 800K disks! The program is supposed to run on any Macintosh from the 512 to the Macintosh II. I ran it without incident on an SE, but it crashed several times on my old 512. Although you can use *TeXtures* with a floppy-based system, do yourself a favor and don't. And even on a hard disk, it quickly gobbles up over 3 megabytes if you install all the files and fonts provided.

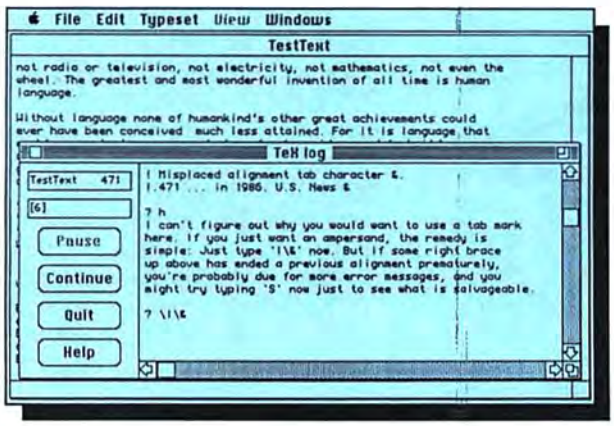
Most of the disk space is, in fact, taken up by the enormous font files *TeXtures* requires to properly typeset in the Computer Modern family of typefaces — all 75 of which are supplied with the program. The 123-page manual all too briefly mentions these relatively unknown typefaces. It says you may not need them all and, at one point, directs the user to *The TeXbook* (which accompanies the manual) where, unfortunately, most of the fonts are not even dealt with. So the first-time *TeXtures* user, while sorting through the various fonts during installation, has to struggle with esoteric abbreviations such as cmdunh10, cmtcsc10, and cmssi17, without having the slightest idea of what it all means, unless she shells out nearly $40 for Knuth's *Computer Modern Typefaces*. *TeXtures* can typeset and preview in any font on your *System* file.

Every *TeXtures* document has three windows. The topmost window is the Input window, and it's the first you'll see when you choose NEW from the File menu. This is where you initially type in your text and TeX formatting codes. The major disappointment here is that the window does not auto-scroll as you drag select portions of text. When you reach the bottom of the window, you must scroll down, using the scroll bar at the right side, and then shift-select more of the text. Another "feature" is the fact that, although you can print the contents of the Input window without having it interpreted into typeset text, the top of the file must be visible in the window — if it's not, the missing portion does not print out. The screen font of the Input window is preset at 9-point Monaco, but the FONT command on the Edit menu can change it.

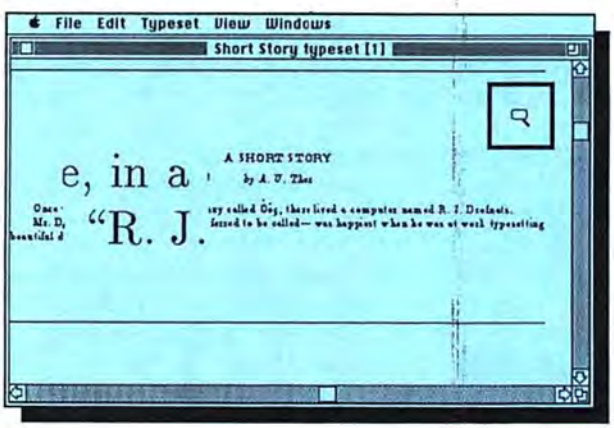
There's also a Log window, where TeX keeps you informed of errors and its progress during the typesetting sequence. Errors are noted, and if bad enough, bring the process to a



The three windows of every document in *TeXtures:* (counterclockwise from the top) Input/Edit window, Preview/Typeset window and the Picture window where most of the graphics for the file are stored.



Help is on the way! When typesetting a document in *TeXtures*, a Log window pops up and keeps you informed of just what TeX is up to. This is also where problems are reported and where you might be able to find the solution via the Help button.



The Preview/Typeset window in *TeXtures*. One page at a time, a document is previewed on screen. The cursor, now a magnifying glass (see insert in black bordered box) can be positioned over any part of the page for a closer look.

temporary end. You're notified of the problem and the line where it occurs. A tap on the Help button to the left of the window provides you with a possible solution that you can insert or choose to ignore. Should you choose CONTINUE at this point, TeX will finish the typesetting sequence — with possibly unexpected results.

Unlike other Macintosh non-WYSIWYG typesetting programs (such as *JustText*), *TeXtures* allows you to preview what your document will look like when printed. To do so type COMMAND-T or select TYPESET from the Typeset menu while the Input window is active. The title bar of the new window will show the file's name with the word "typeset" and a bracketed page number. You can only preview one page at a time. If the document is multi-paged (a book, for instance), you can preview other pages through the NEXT PAGE, PREVIOUS PAGE and SELECT PAGE commands of the View menu. Pulling down the View menu also gives you the option to inspect the previewed page at various magnifications: Fit to Window, Actual Size, 120% Size, 200% Size, 417% Size and Select Size (COMMAND-M), which allows you to specify a magnification, from one-tenth to five times the actual size.

The 417% is an unusual choice, but welcome because of the ratio of Mac screen pixels (72 dpi) to the LaserWriter resolution of 300 dpi. Viewing a page at this magnification is basically equivalent to viewing laser FatBits — handy for checking kerning and the fine details of typography where accuracy counts.

The Windows menu allows you to move back to the Input window if you need or want to make changes (the Preview window is not interactive). Once you have done this, you must TYPESET the file once again to see the changes take effect in the Preview mode.

The final typeset document can be printed on an ImageWriter or any PostScript printer. The PRINT command is, in good Macintosh fashion, found in the File menu, and must be used only when the Preview window is visible.

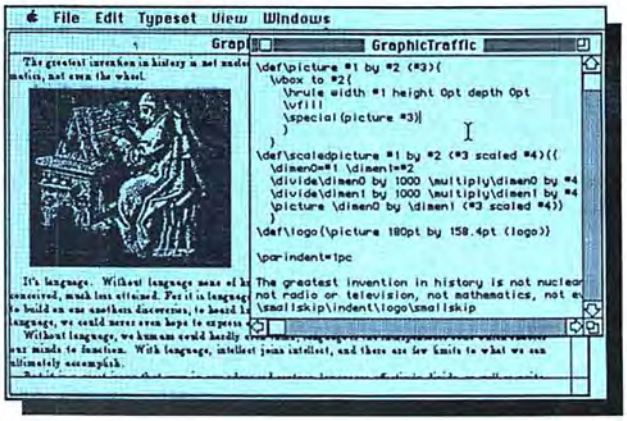
THROUGH THE MAGNIFYING GLASS

By far the most impressive feature of *TeXtures*' Preview window (and to some extent, of the entire software package) is a tool called the magnifying glass. While in the Preview window, the cursor takes on the shape of a lens. You can move it over any portion of the page, press and hold down the mouse button, and *voilà* — a rectangular block of the text pops into view at over four times its actual size. Once again, this can be a great aid for fine tuning.

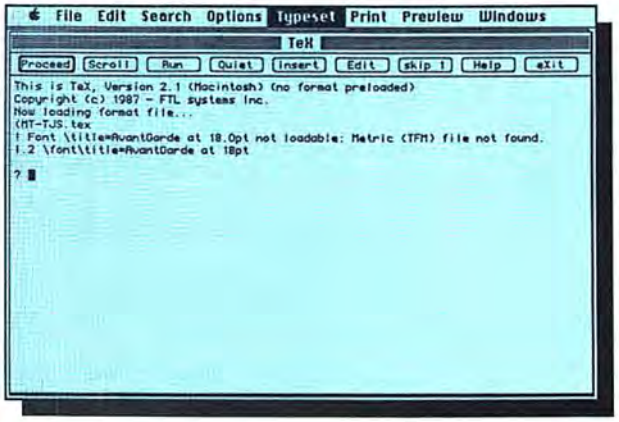
GRAPHIC TRAFFIC

The third window is the document's Picture window. All documents have this window, whether or not they have graphics (in the latter case, the window is empty).

TeXtures includes in its on-disk sample file (Picture Example) two TeX macros for placing graphics in text. These allow you to place a graphic at actual size or at any scaled size into a TeX document. The pro-



The placement of graphics is not one of TeX's strengths. Here you can see how *TeXtures* does it — not by the click of the mouse button, but code by painful code.



***MacTeX* grinds to a halt during a typesetting run. The problem is spelled out, complete with the offending line. Your response? One of the buttons just below the title bar.**

cedure is primitive in that it can't easily place the graphic except between paragraphs, as in *MacWrite*.

TeX is capable of more elaborate graphic insertions, including spectacular arbitrary text wraparounds, but it requires a great deal of code-intensive finagling (at least by current DTP standards) — a rather crude technique that is totally removed from the ease with which one can accomplish the same aim in *Ready, Set, Go!* 4.0 or other Macintosh DTP programs.

Any number of graphics can be placed into the Picture window (unfortunately, you must cut and paste between the graphics application, such as *MacWrite* or *MacDraw*, and *TeXtures*' Picture window). Each graphic appears sequentially in the Picture window, identified by a one-word file name. Its original dimensions are indicated in inches, millimeters or picas. You can scroll between various "pictures." When placing the graphic, you must refer to it by typing in the name the program has given it.

"ISN'T THAT \special!"

TeXtures allows the inclusion of sections of PostScript code — a feature that greatly enhances the system's usefulness. TeX's own graphic elements are, to a large degree, restricted to simple lines.

TeXtures also permits the placing of EPSF graphics — without the hassle of pasting anything in the Picture window. If the EPSF file has a screen image attached to it, then this image will appear in the Preview window. But if you want to size this graphic, you have to do it either in the original application or by coding the new dimensions in TeX as described before.

ADDING FORMAT TO INJURY

One of TeX's most formidable capabilities is the adding of formats, or style sheets, to the basic predefined package. *TeXtures* does this through the ADD FORMAT command on the File menu. The publisher has let the user down once again, as it did with its spotty coverage of fonts. It properly tells you that you can create formats by typing in self-designed macros and appending the TeX $bs dump command at the end of the file instead of $bs bye or $bs end. The manual then blithely tells you to refer to page 283 of *The TeXbook* for specific information. You'll find very little there that enlightens the procedure. What the manual omits is the very crucial information that you must TYPESET (COMMAND-T) this newly created file first. When you do that, you'll be confronted with a dialog box asking for a new file name. Type one in and the new format will be generated a TeX add-on that's included in the package. When you return to the desktop, you'll see a new type of *TeXtures* icon, in the shape of a can, which can then be accessed by the ADD FORMAT command or dou-

Font Floundery

Until fairly recently "TeX-ies" around the world have generally used the Computer Modern (CM) family of typefaces. Computer Modern is the name given to a group of fonts based on the old Monotype Modern No. 8A and designed by Donald Knuth with his font generating program *METAFONT*. The fonts are not outline fonts in the Adobe PostScript sense, but function essentially as bit-mapped fonts — which means that the characters only print well in the point sizes distributed with various TeX implementations. Other point sizes must be scaled, and the result is the "jagged-edge syndrome." Addison-Wesley, in fact, recommends that the CM fonts provided with *TeXtures* be used only in 10- or 12-point sizes and that PostScript fonts (that can easily be scaled to any size without loss of quality) be used for headline or display type.

Perhaps the one advantage that CM fonts have right now is that some of them have extensive character sets that include the symbols needed for complicated mathematical typesetting (the Monotype series was famous for this — that's likely the reason Knuth took an interest in Monotype). But even this aspect will soon vanish when Adobe's special Lucida Math typeface is available.

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MacTeX **to the rescue, once again, this time through the Help feature under the Apple menu. TeX's commands and control sequences are listed. You're just a mouse click away from what they all mean — complete with an example and references.**



MacTeX's **Option menu, where the user has complete control over how, when and where just about anything happens.**

ble-clicked to open up a new document that is governed by the user-defined format. This new format, by the way, does not replace the default "plain TeX" format that is preloaded into the program. It is, rather, added on top of "plain TeX." The default format remains in place with its own macros functioning, unless you have redefined them in your own creation.

A TeX-NICAL KNOCKOUT

MacTeX, from FTL Systems in Toronto, Canada, was the first implementation of TeX for the Macintosh, originally appearing in 1986. The folks at FTL have adopted a very different approach to TeX. The interface sometimes diverges from what you expect (for example, the Print commands are found in a special Print menu rather than under the File menu). More importantly, FTL includes a modified version of the traditional TeX format. The modifications all aim at one goal: bringing the TeX environment more into line with PostScript and the current DTP market. There's nothing wrong with that, but a word of warning to the unwary: When you're reading through *The TeXbook* (a prerequisite for learning to use the TeX syntax and grammar to program *MacTeX* as well as *TeXtures*), many of the comments about font commands ($bsbf, $bsit, $bsrm and so on) are not quite valid. These commands no longer refer to the Computer Modern typefaces, but to Adobe's PostScript version of Times. There's a handy appendix in the *MacTeX* manual listing *some,* but not *all,* of the differences between FTL's version of TeX and the real TeX that forms the basis of Knuth's book. So tread carefully.

All inputting and coding takes place in a basic editing window. Before you can typeset your document however, you must name it. Unlike *TeXtures,* where file names can be chosen at will, *MacTeX* requires that all files to be typeset and previewed must end with the extension ".tex" — Macintosh users finally get a taste of what the CP/M and MS-DOS worlds have had to suffer through all these years.

When you are ready to typeset and preview a document, pull down the Typeset menu. There are three choices: TYPESET <filename> (this typesets the current file); TYPESET FILE (this takes you to a dialog box where you can choose any file); and relax mode (which allows you to enter text, which will be processed one line at a time until you type $bsbye).

Once you've sent a file to TeX, a Log window appears and gives you a running commentary on what *MacTeX* is doing during the typesetting sequence: loading a format, processing a line, finding a mistake and so on. While this is happening, *MacTeX*'s special at-work cursor appears to indicate that TeX is busily at work. You'll see this cursor a lot.

Occasionally, the typesetting procedure will stop and *MacTeX* notifies you that it has found an error. The specifics of the error are noted directly after the "!." The offending line number and actual input are then reported. Most of the options listed just below the window's name bar as buttons function more or less as the equivalent choices in the *TeXtures* Log window: Proceed works like Continue and Exit takes on the function of Quit. Help is the same for both programs: It brings up a message about the nature of the problem and a possible solution, if any. *MacTeX* also provides an additional form of help in the form of a Help function, which is available on the Apple menu. This function provides information on any TeX primitive, complete with a list of references to it in *The TeXbook.*

Once the pre-typesetting sequence is complete and a dvi file is generated, the Log window's menu bar disappears behind a flashing black message bar that prompts you to hit a key or the mouse button. You can then preview the dvi file on screen. The Preview window is substantially the same as in *TeXtures.* There is no magnifying glass available, unfortunately, but there is a *MacPaint*-like Show Page function that allows you to determine where the window will center when you move from a smaller size up to a larger magnification.

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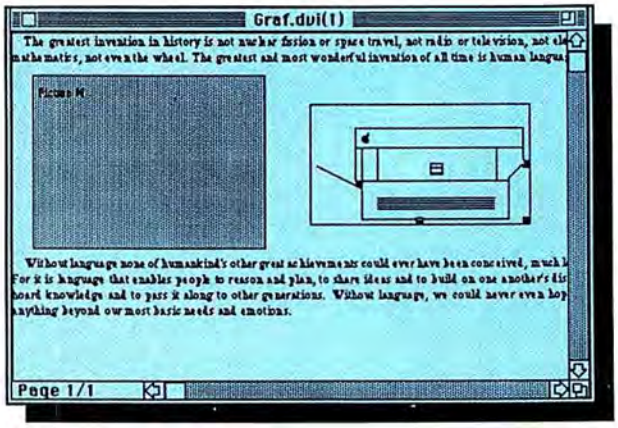
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Deep in the Heart of TeX



An example of *MacTeX*'s sometimes innovative approach to typesetting in TeX. The gray field on the left is the graphic field. Another graphic field is on the right, but this time with a graphic pasted in from the Scrapbook. Such graphics can easily be resized in *MacTeX* without elaborate coding.

There is very little that really differentiates the two programs up to this point. The user goes through more or less the same procedures to input, typeset and preview a file. *TeXtures* creates *one* file with a text window, a typesetting or Preview window and a Picture window. *MacTeX* creates a second separate dvi file which is written to disk each time you typeset the corresponding .tex file. The dvi file is the one that *MacTeX* actually accesses when it previews. In addition, a log file is also created if you have set that as an option. All of this slows *MacTeX* down considerably and can clutter up your desktop with up to three separate files for each job, but it's more in keeping with the way TeX has been implemented in the past on other systems.

Another way in which *MacTeX* complicates TeX for the Macintosh is that *INITeX*, the format generating companion application for TeX, is a totally separate application in the FTL scheme of things. Without going into detail, this gives you greater control (including access to the hyphenation exception dictionary), but slows the whole typesetting process down and makes for an often confusing work environment. You might think that all this adds up to a clear victory for *TeXtures*. But one thing balances out the scales and, for some people, tips it in *MacTeX*'s favor.

OPTIONS AND MORE OPTIONS

Pull down *MacTeX*'s Options menu, and you'll find a plethora of extra features that serve to offset the program's relatively sluggish performance. SET EDITOR allows you to select the screen font and point size of the Input or Edit window, and to choose the style (Plain, Bold, Italic), auto-indenting (if you begin a line with tabs, every subsequent line will be similarly indented), and SHOW INVISIBLES (so that you can see returns and tabs). SET PRINTER allows you to use *MacTeX*'s built-in printer spooler. SET PREVIEW allows you to specify the default page size and magnification factor you'll see in the Preview window, whether you want to be prompted for a starting page when the Preview begins and the maximum number of Preview windows that can be opened for any file (you could, for example, select 2 and see facing pages during Preview). SET CONVERTER is yet another outstanding feature of *MacTeX*. Through it you can open and convert *MacWrite* or *Word* (though not 3.01 at this time) documents into TeX formatted files. It's actually an excellent way to learn TeX, at least in terms of producing fairly simple pages. You can also embed TeX commands directly into a *MacWrite* document by placing the commands in shadow type.

You can also determine what automatically happens when the typesetting sequence has finished: Instead of displaying a flashing black message bar, *MacTeX* can be told to immediately preview the file or to send the file to the printer without preview.

DEFINE KEYS brings up a screen where you can define up to 10 of the commands or control sequences you frequently use in your work.

MacTeX means power and control. And the Option menu is where you'll find the tools or features you'll want or need.

INTERACTIVE GRAPHICS INTERFACE — SOMETIMES

In *MacTeX*, any graphics placed in the Scrapbook can be cut and pasted into the dvi file in the Preview window. First, though, you must

Becoming a TeXpert

TeX, as you might have gathered, presents some problems for the beginner, but there is help out there. The main source of relief for the exasperated is the TeX Users Group. They publish an impressive newsletter called *TUGboat*, that is an invaluable source of info on the current status of TeX. Each issue runs over 200 pages and contains articles, reviews, advertisements and hints covering all aspects of TeX and related programs. The material often ignores the beginner, but there's still food for thought even for the most inexperienced.

Membership in TUG includes a subscription to the newsletter, which comes out three times a year. The cost in North America is $30 per year for new members. Inexplicably, membership fees rise to $40 for renewals. Inquiries should be sent to:

TeX Users Group
c/o American Mathematical Society
PO Box 9506
Providence, RI 02940-9506

Another valuable source of information about the TeX environment is the five-volume series, *Computers and Typesetting*, written by Donald Knuth and available from Addison-Wesley at $30 to $40 per volume. Volume A, *The TeXbook*, accompanies both *TeXtures* and *MacTeX*, and takes a detailed look at the TeX language. Volume B, *TeX: The Program*, is a highly technical exploration of the inner workings of TeX. Volumes C and D deal with *METAFONT*, Knuth's font generating program that will hold little interest for DTPers in this age of Adobe, PostScript and *Fontographer*. Volume E, *Computer Modern Typefaces*, although useful, will probably gradually become interesting more for historical reasons, since it is highly unlikely that the CM family of fonts will do anything else than fade away.

type in code that will leave an appropriate amount of space for the graphic. When you typeset the file and finally reach the Preview window, you'll see a gray box, called a graphic field. Click on the box and it becomes active, with three size boxes on the outside frame of the field. You can size and move the field anywhere on the page. Then you can paste in a graphic from the Scrapbook. It appears on the screen where the gray field once was. You can also size and move the actual graphic after it has been placed in this way.

EPSF graphics created with *Illustrator* can be included with a minimum of coding and dealt with interactively. You can also include PostScript files, but as in *TeXtures,* the effects will not be seen on the screen.

TeX TO TeX

Although both *TeXtures* and *MacTeX* are based on TeX, they have adopted quite different strategies on how to port it into the Mac environment. Addison-Wesley opted for a generally user-friendly approach that to a certain extent protects you from some of the painful mysteries of working with TeX (for example, the inclusion of the format generator within the main application itself is nice). FTL, on the other hand, went for a fuller, more traditional implementation that gives you more options and greater control, but at the loss of considerable ease of use. FTL has read the writing on the wall and has mostly abandoned the ties between TeX and the Computer Modern typefaces — something that Addison-Wesley probably should have done — in favor of PostScript fonts. And *MacTeX*'s Create PostScript feature creates "pure" PostScript; that is, PostScript that has not been distorted by a special Prep file. You can create a PostScript file of a document in *TeXtures* by using COMMAND-F after choosing PRINT, but the resulting file can't be easily interpreted.

Which program is best for you? I would like to see a merging of the two. Neither Mac implementation does full justice to TeX. I am impressed by *TeXtures'* appearance, relative ease of use and speed — I might prefer it were it not for the manual problems and if the program had just a few more bells and whistles. So *MacTeX* wins out. But just barely.

GREGORY WASSON IS A FREELANCE DTP TYPESETTER AND LIVES ON A MOUNTAIN NEAR SANTA CRUZ, CALIFORNIA. HE WAS FORMERLY A DOCTORAL STUDENT OF GREEK AND LATIN AT THE UNIVERSITY OF TORONTO.

MACUSER RATING

MacTeX ★★★½

Follows Mac Interface	■ ■ ■ □ □
Printed Documentation	■ ■ ■ □ □
On-Screen Help	■ ■ ■ ■ □
Performance	■ ■ ■ □ □
Support	■ ■ □ □ □
Consumer Value	■ ■ ■ □ □

Comments: Probably *the* TeX environment of choice for the hardcore TeX user on the Macintosh. Very intimidating for others. **Best Features:** Interactive graphics environment and a slew of useful options (*Word/MacWrite* to TeX converters, transfer function, create PostScript file, among others). **Worst Features:** Painfully slow at times; visually unattractive, hard-to-read manual that makes the program more difficult to learn than need be. **List Price:** $750. Published by FTL Systems, 234 Eglington Avenue East, Suite 205, Toronto, Ontario, Canada M4P 1K5; (416) 487-2142. Requires 1M and PostScript printer. Hard disk highly recommended. Not copy protected. Version 2.0 reviewed.

MACUSER RATING

TeXtures ★★★

Follows Mac Interface	■ ■ ■ ■ □
Printed Documentation	■ ■ □ □ □
On-Screen Help	■ ■ □ □ □
Performance	■ ■ ■ ■ □
Support	■ ■ □ □ □
Consumer Value	■ ■ ■ □ □

Comments: Sleek, fast implementation of the TeX page composition language, aimed at the wider DTP market, but falling just short of the mark. Its ease of use might help TeX gain some acceptance in the DTP world. **Best Feature:** The magnifying glass tool in Preview mode; speed. **Worst Feature:** Documentation is sometimes incomplete or outright misleading. **List Price:** $495. Published by Addison-Wesley, Jacob Way, Reading, MA 01867. (617) 944-6795. Requires 512K. Hard disk recommended. Not copy protected. Version 1.0 reviewed.

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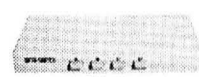
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JIM LUDTKE

Fast Times for Gray Tones

Gray areas in a black and white world: printing quality photographs on the LaserWriter.

BY TOM PITTMAN

"USE POSTSCRIPT FOR *REAL* HALFtones." So the story goes. But how good are the pictures — really?

The Macintosh is a great graphics machine. Combined with the LaserWriter it has made near-typeset page layout practical. The page description language, PostScript, can create line art good enough for professional graphic artists. But what about photographs? PostScript halftones are not the best you can do on a 300 dots-per-inch laser printer. Let me tell you why.

The main problem is that the LaserWriter — and, in fact, virtually every printer — does not print in shades of gray or color, but only in blocks of black and white, or whatever color your ink, but nothing between. The grays and subtle colors we are accustomed to seeing in printed material require a method called "halftones," where the tones halfway between black and white are approximated by alternating tiny dots of black and white. Subtle shades of color are handled the same way, but since the Apple LaserWriter only prints in black, we will concentrate our attention on printing shades of gray.

There are two steps to using a computer to print a picture with various levels of gray in proper halftones. First you have to get the picture into the computer, then you have to turn the gray scale image data into a correct proportion of black and white dots.

SCANNING THE HORIZON

There are several hardware devices on the market for scanning photographs into the computer. One of these, MacVision, actually takes a standard NTSC video signal (like that from a TV camera or video recorder) and digitizes it in the Macintosh. Most of the others involve moving a beam of light across a piece of paper ("scanning" it), and measuring the reflection electronically.

Of all the scanners available, the ThunderScan stands alone. It costs about one tenth as much as any other (list is $249) and creates data files with true gray-scale information. It's still the only full-featured scanner, and is the standard against which to compare all the others.

ThunderScan is distinctive in another way. Other scanners are standalone devices that you put a document on or into. ThunderScan is a cartridge that you attach to your ImageWriter in place of its ribbon cartridge; the document to be scanned is fed through the printer just like a normal sheet of paper. Instead of laying ink down on the paper, the ThunderScan cartridge bounces a red beam of light off it as the printhead scans back and forth.

Whether the ImageWriter carriage transports the ThunderScan cartridge back and forth, or a standalone unit uses its own feed rollers to move a piece of paper past the beam of light and sensor, the end result is that the hardware converts the black, white and gray areas of the original document into a varying electronic signal that the software in the Macintosh can interpret.

The software that drives the scanner is concerned with two things. First is the image resolution, how many samples of data to take per inch of document. The ImageWriter roller advances in steps of 1/144th of an inch, so the maximum ThunderScan resolution possible in the vertical direction is 144 lines to the inch. Lower resolution is possible, and the horizontal direction is usually keyed to the vertical to keep the image proportions correct. Most other scanners scan at 300 dots per inch, but as we shall see, halftone photographs cannot benefit from more than about 150 dots per inch anyway.

The second concern of the scanner is the number of gray levels recognized. ThunderScan creates a data file with 32 gray levels for each scanned dot. That means that each gray pixel of the original document is converted to some integer number on a scale of 0 to 31. Some other

scanners create PostScript files with 16 gray levels for each pixel. All scanners can be operated in a "line-art" mode that goes directly to a digitized image with only two levels (black and white). A few recent scanners promise 256 gray levels.

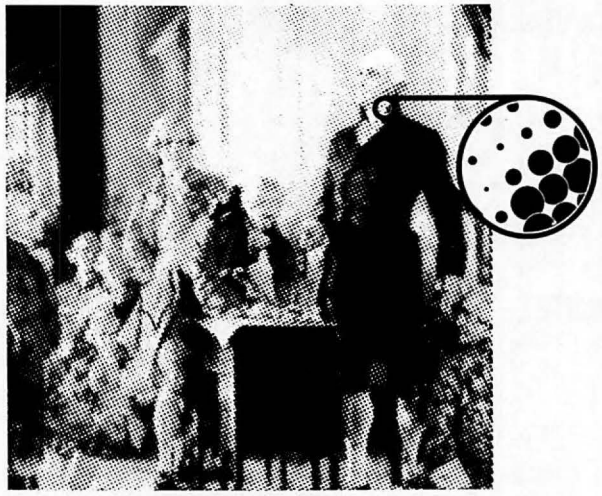


Figure 1
This shows halftones as screened by the photographic process. The picture is enlarged four times over normal magazine halftones.

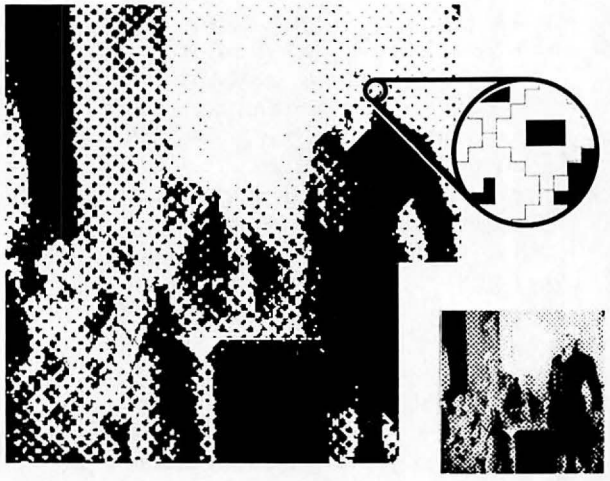


Figure 2
These halftones were screened by the PostScript LaserWriter method, simulating the same dot size (133 dpi) as Figure 1. Blow-up magnification shows cross-shaped screen dots (outlined), each containing five pixels. The inset is actual LaserWriter size.

DOING IT BY HALFTONES

After the image has been scanned, it must be reduced to a sequence of black and white dots for printing. There are essentially two ways to do this. The simplest for LaserWriter users is to send the gray level data directly to the printer and let it do the conversion. It's equally easy to let the scanner do the halftoning and create a *MacPaint* document of black and white pixels to send to the LaserWriter. The LaserWriter uses a digital simulation of the screened halftones used in conventional publishing; the better scanners, including ThunderScan, use a variation on the halftone method called "dithering" to create the *MacPaint* documents. There is a significant difference in the maximum quality obtainable from these two methods.

The LaserWriter has a resolution of 300 dots per inch, but for photographs with gray levels to be printed much of that resolution is lost in the halftone process. *MacPaint* was designed for the 72-dots-per-inch Macintosh screen, so its resolution is implicitly one-quarter that of the LaserWriter. Its effective resolution can be increased considerably by reducing a dithered *MacPaint* document to half or one quarter its nominal size inside the LaserWriter. We are interested, therefore, in how much picture quality can be preserved for the same number of pixels in the two processes. If you were to use magnification to look at a photograph printed in this magazine, you would see hundreds of tiny dots of various sizes, neatly spaced about 133 to the inch. Figure 1 shows an enlargement of a very small part of a photograph reproduced this way.

The light areas of the photograph are represented by small black dots with mostly white space between them; the darker areas use larger black dots that sometimes even overlap. Except where they overlap, the black dots are generally round, and their size is precisely controlled by the brightness of the picture at that point. At normal viewing distance the human eye doesn't see the dots, but only perceives the relative amount of blackness and interprets that as a gray level. On a poor grade of paper such as newsprint, the ink in these tiny dots tends to smear together so larger dots are used, typically 60 to 80 dots per inch.

DIGITAL SCREENS

Conventional wisdom leads us to believe that a digital simulation of the halftone screen process should yield acceptable gray levels, provided that the resolution of the printer is high enough. The LaserWriter's 300-dpi (dot-per-inch) resolution can be subdivided into square cells of five pixels each, arranged in a regular array and spaced about 133 to the inch. With five pixels, there are only six possible gray levels, as shown in Figure 5a. A photograph reproduced with this screen looks like Figure 2. Notice that the edges are about as sharp as the photographic screen in Figure 1, but the limited number of gray levels makes the image look blotchy — somewhat like a poorly-done "paint-by-numbers" picture.

If we decrease the screen dot spacing to 53 dpi (about like newspapers), then the number of intermediate gray levels increases to 32 (see Figure 5b), but the image quality now suffers from a serious loss of edge resolution. This is due to the fact that the gray level data for each dot is averaged over the whole dot cell, and a dot size is chosen to represent that average gray level. With

larger dots a larger part of the picture is averaged and more fine detail is lost.

The writers of the PostScript software in the LaserWriter obviously noticed this problem, for if you examine the PostScript halftones you will see that they are not approximately round as in Figure 5b, but more irregular like the photograph in Figure 3. The LaserWriter and other Adobe PostScript processors use a sophisticated edge-restoration algorithm to sharpen up the image detail lost in the halftoning process.

The problem with the digital simulation of photographic screens is that there are not enough pixels in the smaller dots to get good grays, and the larger dots are too big to preserve the edge details. You would like to use many pixels to get good grays, but it would be nice to place the dots more accurately to get good edge detail. The rectangular array of dots in the photographic process only works when the dots are too small for you to see them.

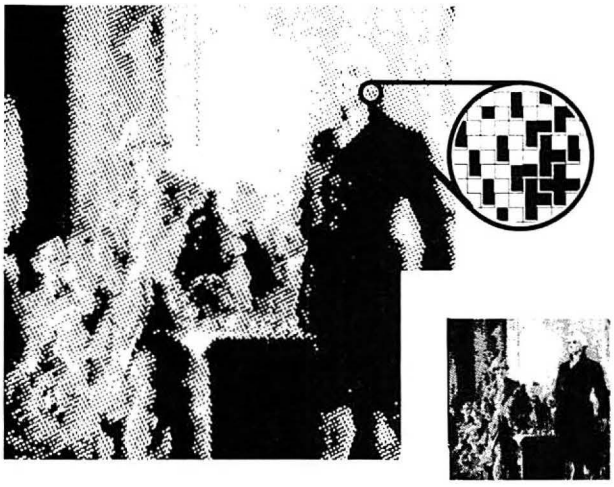


Figure 3
This sample shows halftones screened by the PostScript LaserWriter method at 53 dpi, at the same magnification and pixel size as Figure 2. Blow-up magnification shows larger screen dots (outlined), each containing 32 pixels.

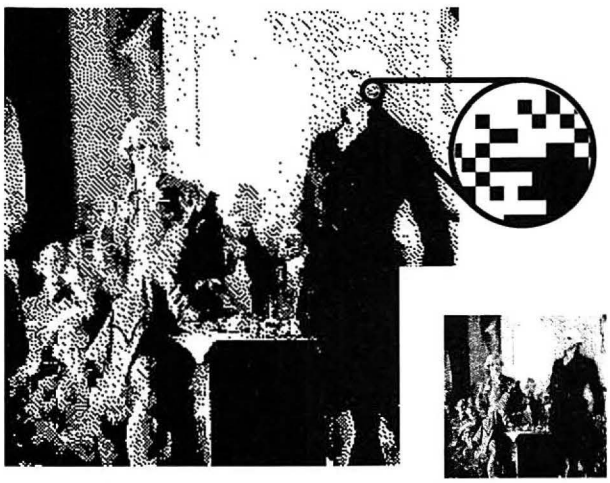


Figure 4
Here the halftones have been dithered by the ThunderScan method at the same magnification and pixel size as Figure 2. Blowup magnification shows the individual pixels.

DITHERED HALFTONES

Dithering is a technique used by ThunderScan to average the pixels over a larger area, thus giving good gray scales. The pixels, however, are not collected into dots as in PostScript, but are individually placed in the image to get the best edge resolution. The result (see Figure 4) has tonal qualities at least as good as the coarse digital screen, but with edge definition better than the finest digital screen, and even better than the Adobe-enhanced digital screen. Note that Figures 2 to 4 were all created from the same scan data, and printed with the same size of pixels; their only differences are due to the halftone algorithms.

Why is the dithered image so much better?

Part of it has to do with the smallest detail the human eye can see, which is about 0.01 inches at normal reading distance. That's 100 dpi. By screening their halftones at 133 dpi, magazines ensure that the average person will not see the individual dots, but only the average gray level. Notice how hard it is to see the individual dots in Figure 5a, compared to the way they stand out in Figure 5b. Halftones only look like gray levels when the individual dots are not visible. Try looking at Figure 3 from several feet away (or across the room) and see how much better the shading looks. The 1-inch inset in each of Figures 2 to 4 similarly looks better than the enlarged versions.

The problem with the digital simulation of photographic screens is that there are not enough pixels in the smaller dots to get good grays, and the larger dots are too big to preserve the edge details.

In principle, the dot spacing in the dithered halftone is 300 dpi (full LaserWriter resolution). Actually, adjacent pixels of the same color don't really count as separate dots, so we should consider the spacing of black pixels in mostly white areas and white pixels in mostly black areas (see Figure 6). For a 25 percent

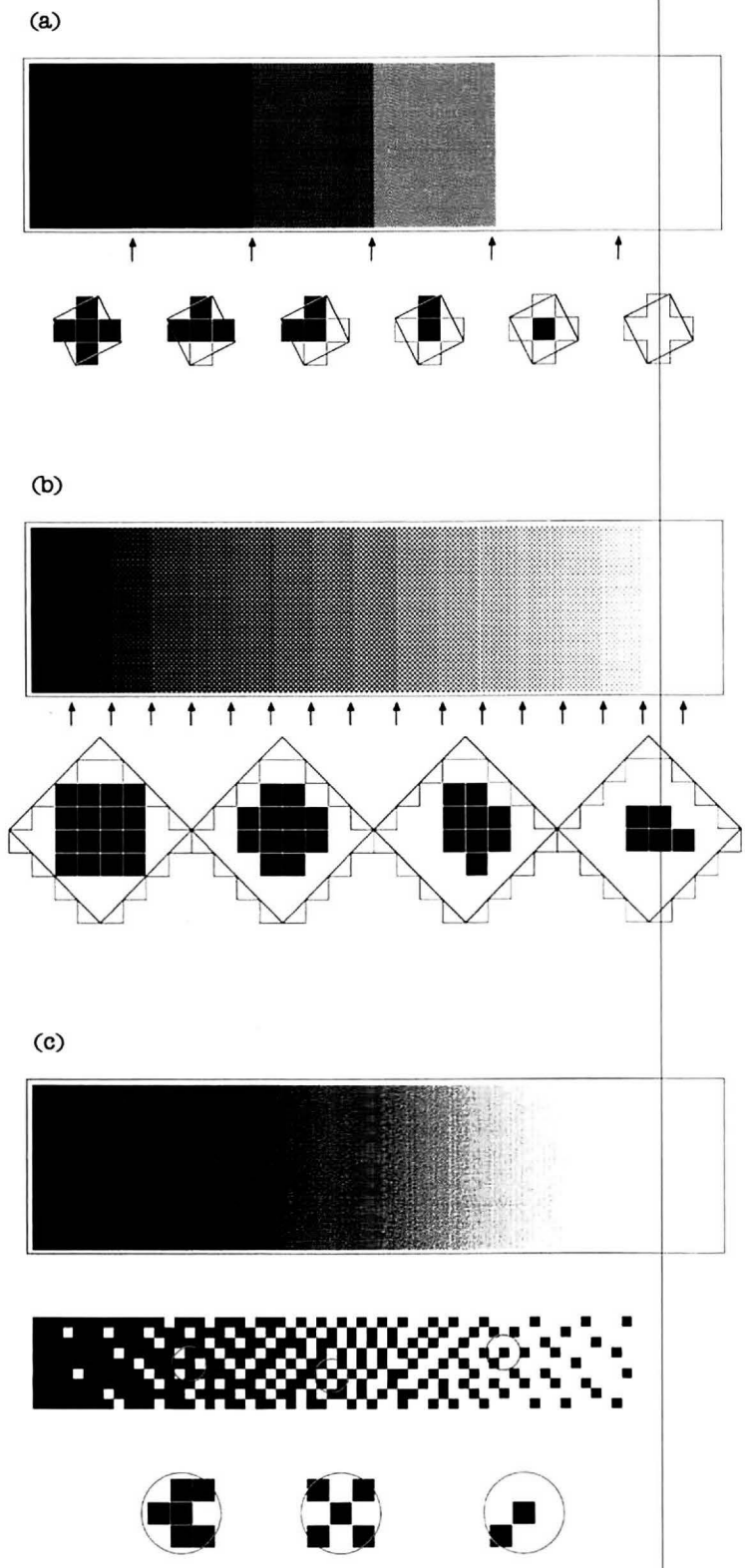


Figure 5
This linear gray scale is reproduced actual size by (a) 133-dpi digital screen, (b) 53-dpi digital screen, and (c) 300-dpi dither. Note the distinct boundaries between gray tone levels, most visible in (a) but also in (b), though not in (c). In (a) and (b) the idealized dot square outlined is approximated by the actual dot cell. Although the 53-dpi screen is capable of 33 gray levels, only 16 bands are visible because the gray scale data is transmitted to the printer in 4-bit pixels. The enlargement in (c) illustrates the 0.01-inch resolution circle for three different levels of shading.

gray tone (that is, 25 percent black and 75 percent white) the black pixels are spaced at 150 dpi; at 12 percent they are spaced at 100 dpi. At 50 percent the effective spacing is greater than 200 dpi, going back down to 150 dpi and 100 dpi for 75 percent and 89 percent. Only very near white or black do the dots get spaced out far enough to be seen. This is evident in the nearly white background around George Washington's head in Figure 4, where the gray tone is 5 percent or less and the tonal quality becomes somewhat grainy.

The tonal quality of a digital halftone is similarly limited to the smallest visible dot size. If your eye can distinguish 0.01 inches, then it will have about nine LaserWriter pixels to average into a range of ten gray levels. Figure 5c shows some 0.01-inch circles enlarged so you can see that several pixels are averaged for the gray level seen in dithered images by the human eye. Without crisp black halftone dots to focus on, you may only notice differences in brightness spaced by 0.02 inches, with the result that you will be able to see nearly 40 distinct gray levels.

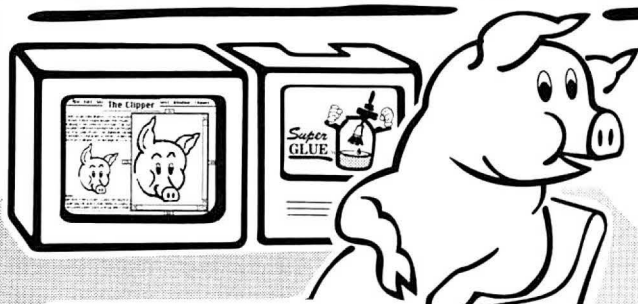
USING DITHERED HALFTONES

"TANSTAAFL," they say, "There Ain't No Such Thing As A Free Lunch." That's as true here as anywhere. There are several disadvantages to using dithered halftones in your desktop publishing. Only ThunderScan and MacVision create them correctly, and only ThunderScan can scan a document large enough to be reduced for the required quality. And ThunderScan is slow, very slow. The bitmap file of a dithered image is huge and difficult to manipulate, an 8-inch square picture was constructed from 16 *MacPaint* files and reassembled in *MacDraw,* nearly filling a 400K file. It took almost an hour to print on the LaserWriter!

You cannot scale a dithered image except in multiples of the pixel size. So if you decide that the photograph of George is 20 percent too big, you have to re-halftone it all over, 20 percent smaller. And forget special effects like perspective distortion.

Faced with this dilemma, I wrote a

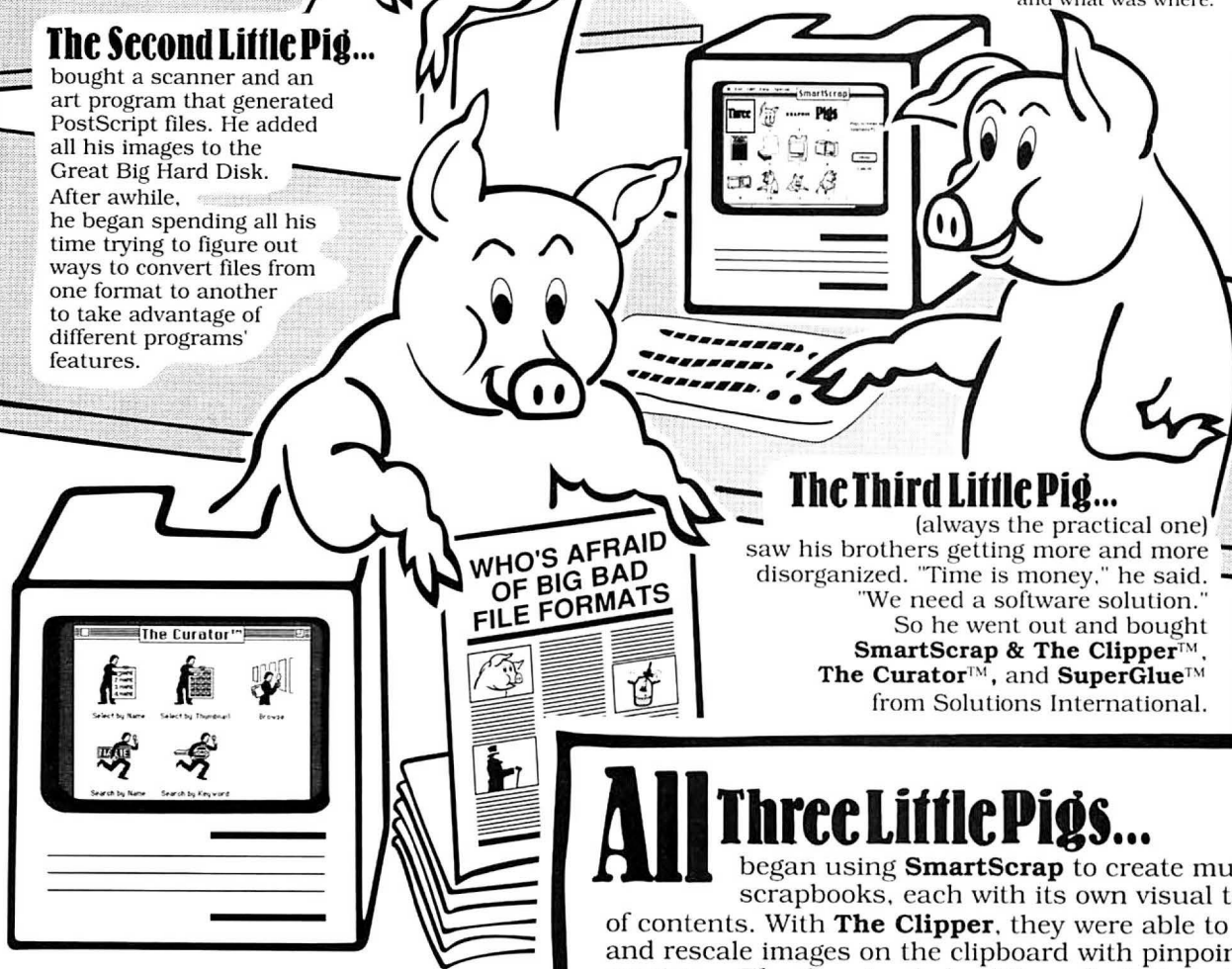
The Three Little Pigs GET GRAPHIC



Once upon a time...
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The First Little Pig... bought their business a paint program, a drawing program, a layout program, and a Great Big Hard Disk. He created so many teeny little files that he quickly lost track of what was what and what was where.

The Second Little Pig...
bought a scanner and an art program that generated PostScript files. He added all his images to the Great Big Hard Disk. After awhile, he began spending all his time trying to figure out ways to convert files from one format to another to take advantage of different programs' features.



The Third Little Pig...
(always the practical one) saw his brothers getting more and more disorganized. "Time is money," he said. "We need a software solution." So he went out and bought **SmartScrap & The Clipper™**, **The Curator™**, and **SuperGlue™** from Solutions International.

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Fast Times for Gray Tones

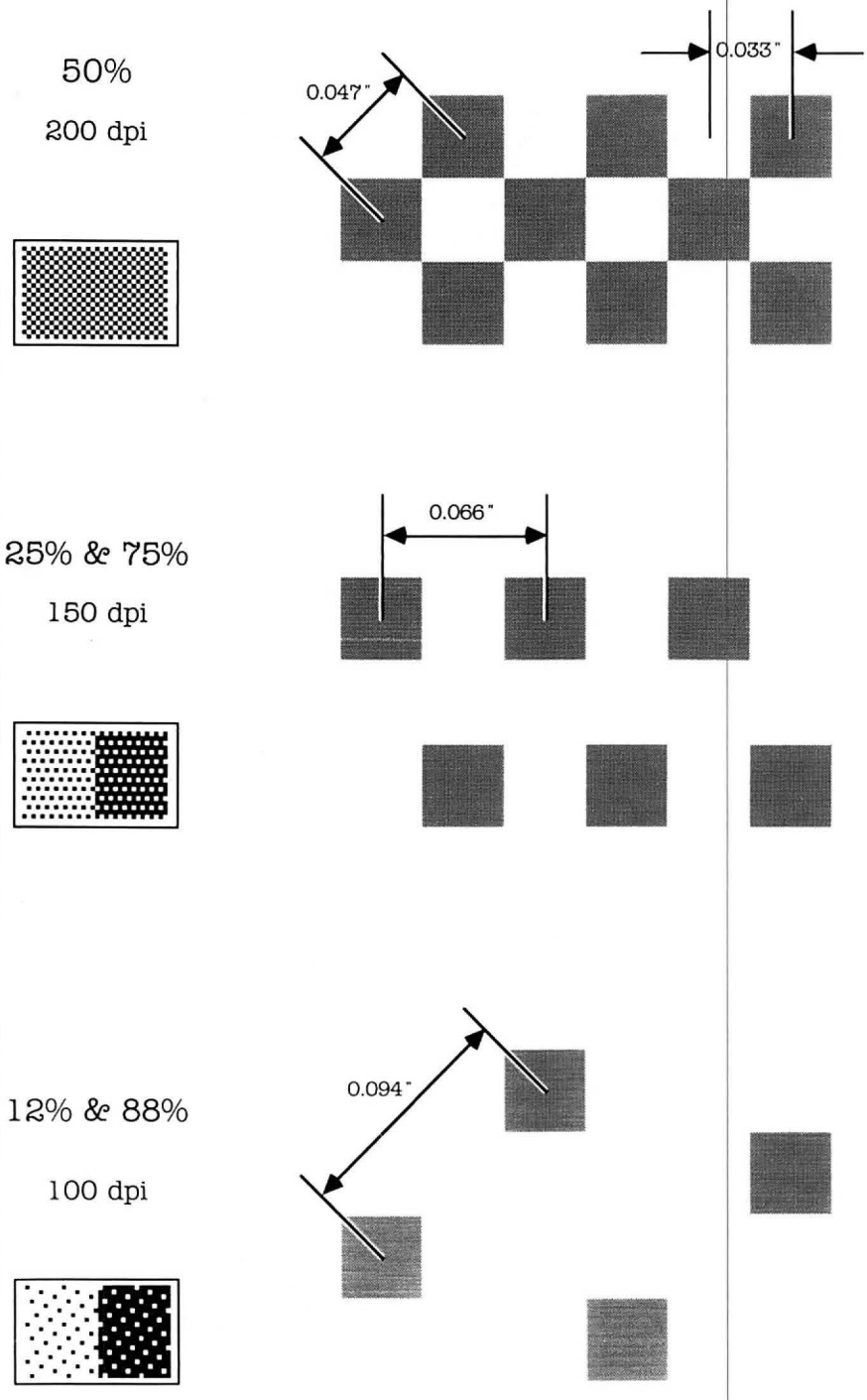


Figure 6
The effective dot size for idealized dithered halftones is the nominal spacing between adjacent black dots (when white dominates) or adjacent white dots (when black dominates). For the LaserWriter with pixel spacing at 300 dpi, a 50 percent gray tone has black (or white) dots spaced about 200 dpi. A 25 percent gray tone has the black dots spaced at 150 dpi, and 12 percent gray tone has black dots spaced at about 100 dpi. The spacing of the white dots at 75 percent and 88 percent is the same as the spacing of black dots at 25 percent and 12 percent.

program to generate dithered halftones from ThunderScan SCAN files. The program has options for a variety of special effects as well as for scaling to any size. A separate option cuts the dithered picture into 16 *MacPaint*-sized documents that you can rejoin as LaserBits in *SuperPaint*, or else paste into *MacDraw* using a full-page copy utility like *Art Grabber* +. The program is excruciatingly slow, but I think the image quality is worth it. If there is sufficient interest, I can recode it in assembly language, which should speed it up ten times or so.

To prepare a dithered picture for printing, you must take care to turn "Smoothing" off in the Page Setup menu. Smoothing tends to run the pixels together into clumps, which destroys the advantages of dithering. I get the best results with the new LaserWriter driver (4.0 or later), which, if you select OPTIONS, lets you select Precision Bitmap Alignment. This reduces the picture size by 4 percent so that the pixels of the dithered image exactly match the pixels of the LaserWriter.

If you're printing from *MacDraw*, set the reduction to 25 percent before you paste in the *MacPaint* documents. If printing from *SuperPaint*, use the LaserBits option to paste in the individual files, then print at 100 percent. If you save the *SuperPaint* file as PICT, it can be opened in *MacDraw* (or *PageMaker* or another page layout program) and printed at 100 percent. Remember to turn off Smoothing and to set the Precision Bitmap Alignment option in the Options in the Page Setup of any program you use to print.

Now you can print photographs of the highest possible quality on your LaserWriter or other 300-dpi printer. The loss of detail due to halftoning is minimized with the ThunderScan dithering algorithm, making the best use of its gray-scale data. Scanners with more than 150-dpi resolution cannot improve on it. A separate program generates scaled halftone *MacPaint* documents from the ThunderScan files. Assembling these in *MacDraw* and printing reduced to 25 percent completes the process. The program has been uploaded as shareware ($5) to CompuServe. By the time you read this it should be available from most user groups as well.

TOM PITTMAN IS AN ASSISTANT PROFESSOR OF COMPUTER SCIENCE AT KANSAS STATE UNIVERSITY. YOU MAY WELL REMEMBER HIM FOR HIS WIDELY USED IMPLEMENTATION OF TINY BASIC, BUT HE PROMISES BETTER THINGS ARE YET TO COME.

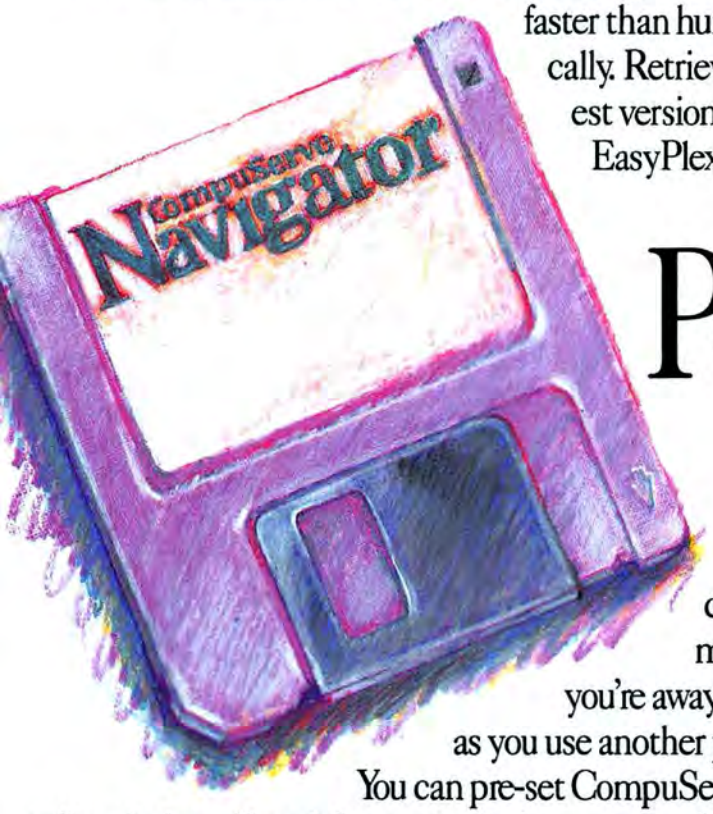
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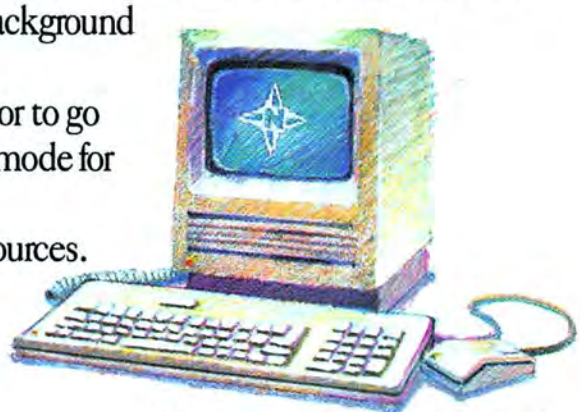
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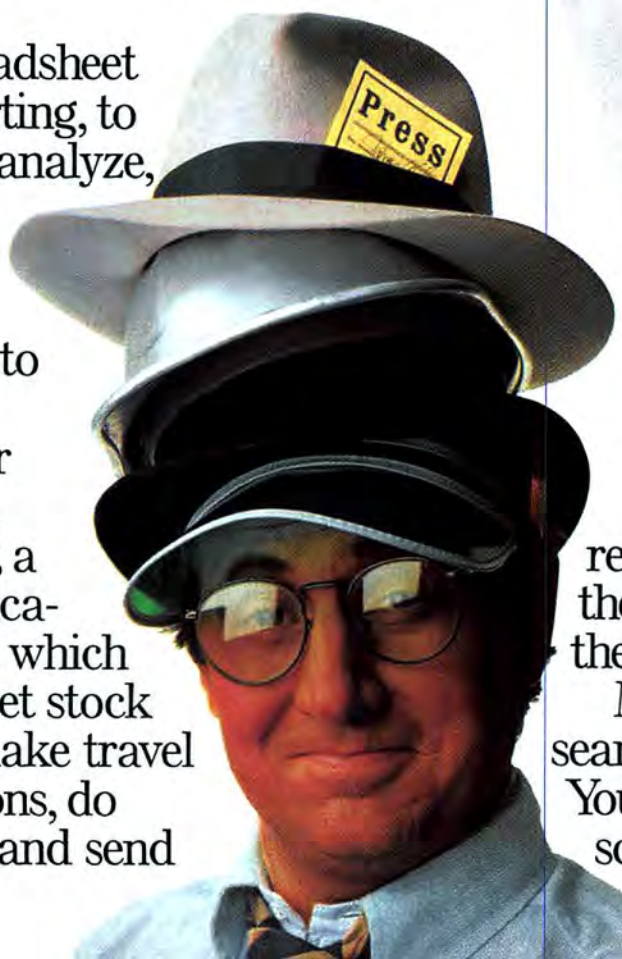
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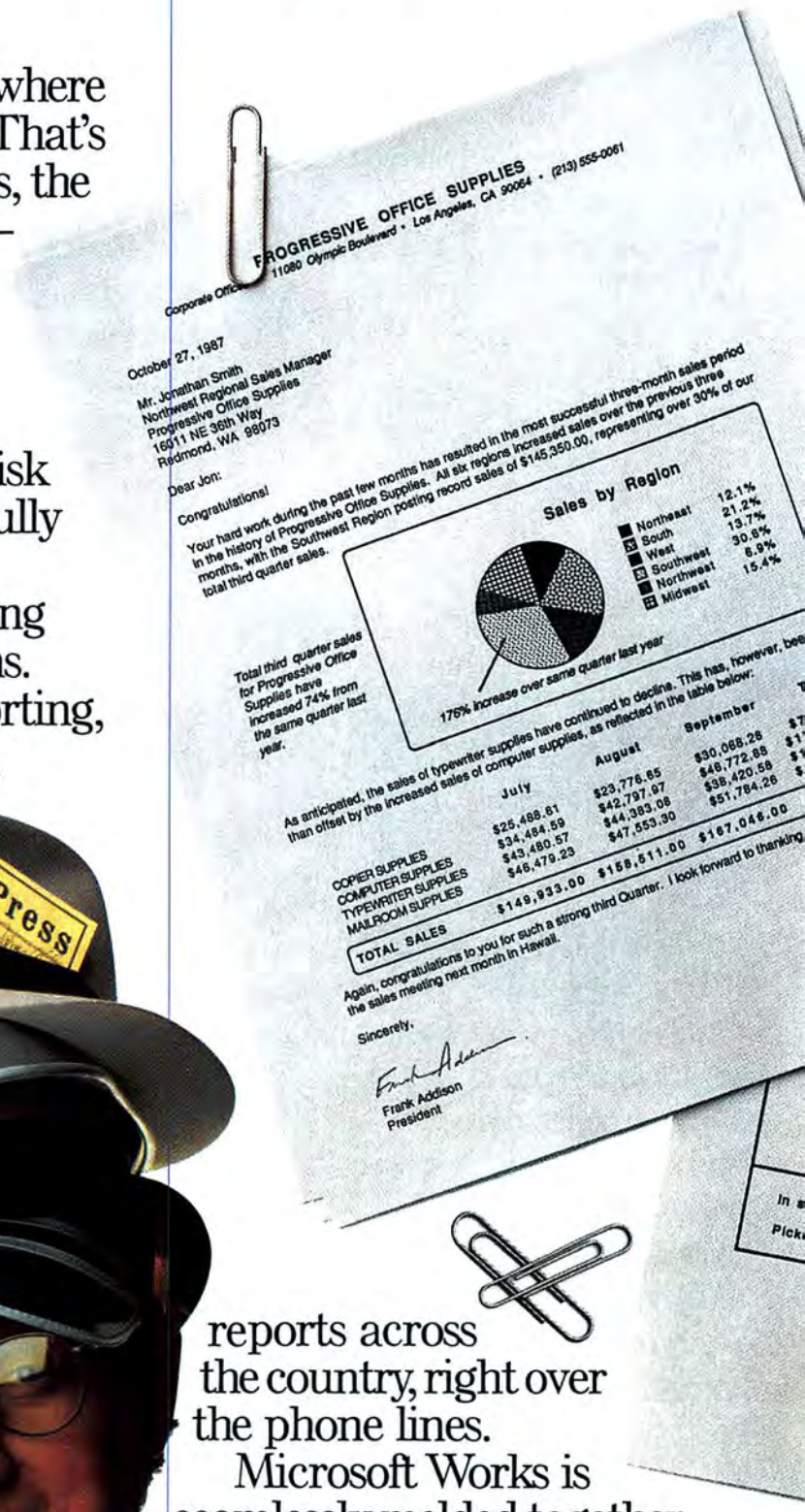
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October 27, 1987

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Progressive Office Supplies
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Redmond, WA 98073

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Sales by Region

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176% increase over same quarter last year

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COPIER SUPPLIES	$25,488.61	$23,776.65	$30,068.26
COMPUTER SUPPLIES	$34,484.59	$42,797.97	$46,772.88
TYPEWRITER SUPPLIES	$43,480.57	$44,383.08	$38,420.58
MAILROOM SUPPLIES	$46,479.23	$47,553.30	$51,784.26
TOTAL SALES	$149,933.00	$158,511.00	$167,046.00

Again, congratulations to you for such a strong third Quarter. I look forward to thanking the sales meeting next month in Hawaii.

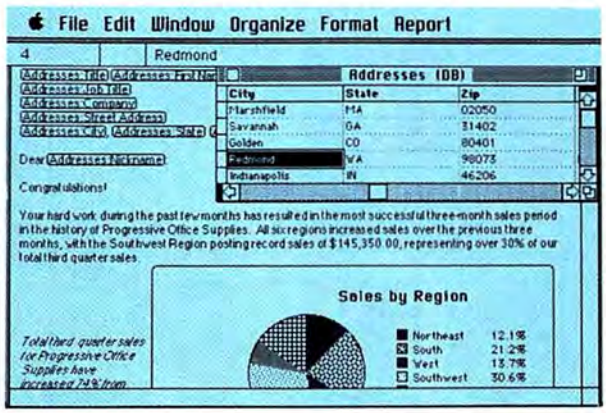
Sincerely,

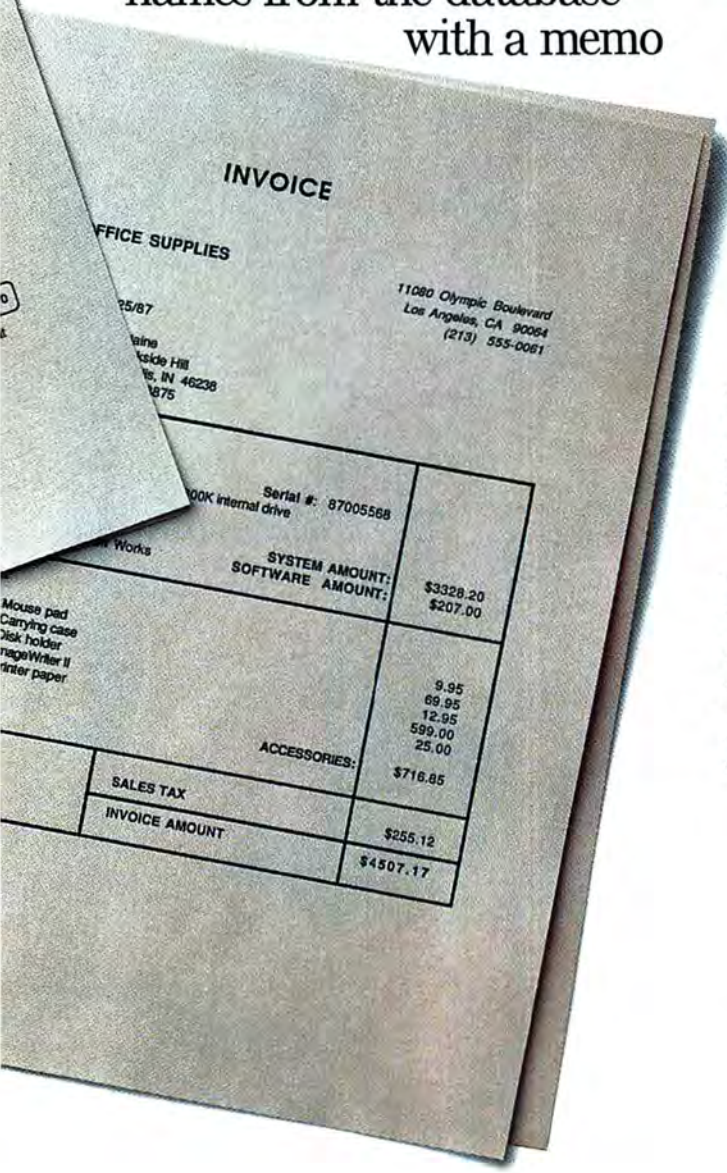
Frank Addison
President

like Microsoft Works.

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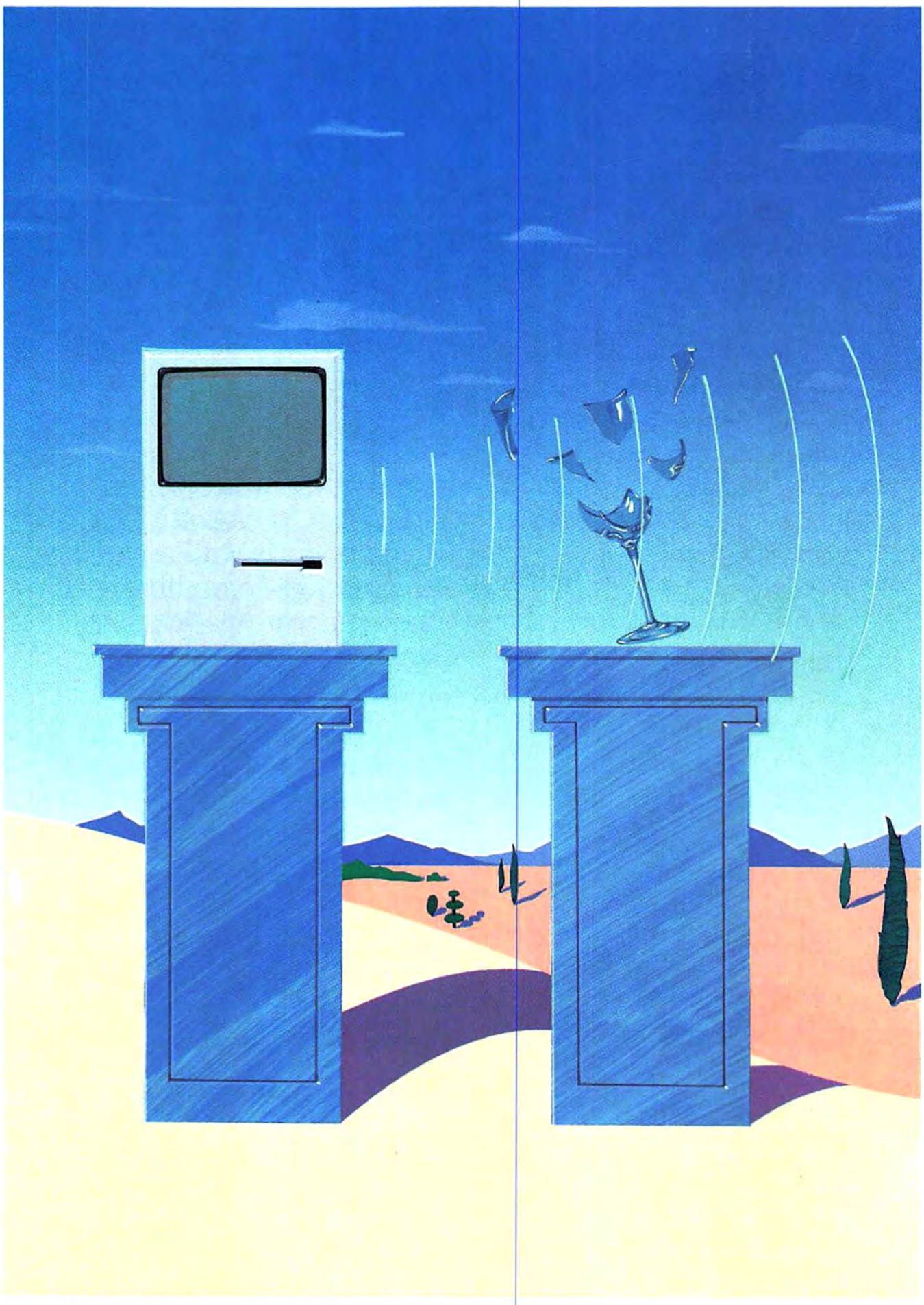
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Aural Fixation

NUMBER CRUNCHING. SPREADSHEETS. Data bases. Programming. Crashing after you finish five and a half hours of typing but before you save it. You might think that is all computers are good for. Not true. There is at least one more thing. Sound.

Wait! Don't turn the page yet! Yes, it's true. Computers have sound.

"Yeah. Right. Blips, bleeps, and blops. Big deal. Ho hum."

Well, if you think that computer sounds aren't worth much, you're partially right. Most aren't. However, there are a few exceptions, and one computer which has excellent sound capabilities is the Macintosh. The startup and alert beeps are simple, square-waved sounds — nothing compared to what the Macintosh is capable of.

SoundWave is an innovative program for the digitizing of sound. And you thought you'd heard it all.

SOUNDS GOOD SO FAR

The four-voice synthesizer and digital-to-analog converter built into all Macs (except the II which has even more advanced capabilities) create amazing sounds. The problem is getting the sound into a digital format from an analog atmosphere. There is a simple solution though, and it is the Impulse (formerly MacNifty) Audio Digitizer with its *SoundWave* software. It contains most of the power you need to create and manipulate your own sounds on the Macintosh.

The Impulse Audio Digitizer converts analog sounds into digital formats or samples. The hardware connects to the Mac via the modem or printer port. Sounds enter the digitizer through a microphone, tape recorder or some other source, and are converted into digital samples. The samples are then relayed to the computer in a digital format, which the computer can understand. When this process is complete, the sound appears in a window as a series of dots or jagged lines (you can choose between the two). The *SoundWave* software then allows you to play and manipulate the sound you have just created.

A NEW RECORD!

Upon entering *SoundWave,* you make one of two choices: Record a new sound, or open an old sound

BY ROBERT S.T. GIBSON

and edit it. If you choose to record a new sound, you have a problem to solve. How do you set up the equipment? Fortunately, it isn't hard or complicated. All you have to do is plug the box in, and attach it to the computer's modem or printer port via the cable provided. Then, connect the microphone or a cassette player to the box. The microphone has its own cord, but a cassette player requires a cable with an RCA-type plug, which isn't provided. If you are using a tape recorder, you can plug the cable into an Audio Out jack or a monitor jack, and if you are using a radio, you can use the earphone jack.



The Record dialog lets you record sounds through the Box. You can also choose the scope function, which shows an oscilloscopic view of the sound that is entered, without actually recording it. You might say that it goes in one ear and out the other. You can also choose between four different sampling rates. The amount of seconds of sound that can be recorded before *SoundWave* automatically stops is also shown here.

To record, all you have to do is select RECORD from the file menu. A dialog appears on the screen providing you with options. You can record a sound at four different sampling rates: 22, 11, 7.5 or 5.5 kHz. These rates determine the quality of your sound, and also how much memory the finished sound file will consume. The higher the rate, the better the quality and, consequently, the more memory the sound will use up. At 22 kHz, one second of sound requires 22 kilobytes of memory. Record at the highest sampling rate that gives you enough time. If you don't need a high-quality sound, you can change its sampling rate later, while editing it.

Don't set the gain or volume too high (on the digitizer box) or the sound will be clipped off at the top and bottom, and will not sound like it was supposed to.

Make sure the input icon selected is for the port that the digitizer is attached to (printer or modem port), and press the Record button or hit Return after readying the input device. If you use a tape recorder, set the tape to a little before the sound, so you can start the tape, then start recording when desired. Remember that excess sound can be cut off later on, so don't worry about having bits of other sounds before and after the one you want. Since a new window is opened every time you record, you can't record into one that is already open. Press the mouse button when you want the recording to stop. If you don't, *SoundWave* automatically stops recording when all of the memory is used up. Therefore, if you are recording a long sound, you should probably have the RAM cache turned off, just in case. When the recording session is complete, the recorded input shows up in a new sound window. Now, press the play icon on the left side of the window. It's the one that has a speaker with a strange jagged line coming out of it. If you did everything right, you will hear the sound as you recorded it. If you don't hear what you expected, you either made a mistake or the hardware is faulty.

A CHANGE OF NOTES

After recording, or upon opening a prerecorded sound, you can view it in its window. A zoomed window shows a close-up view of the sound. An Overview display or scroller, which shows a condensed view of the sound and has a unique scrolling technique, is displayed near the top of the window for easy and quick movement of the zoom window area. Selections can be made in both the zoom window and the Overview display, so fine details or large amounts of sound can be selected quickly.

You may choose from several powerful capabilities for sound manipulation, which include filtering, sound delaying for effects like reverberation and echo, reversing and smoothing the sound wave.

Here's what the options do:

Amplify allows you to adjust the amplitude of the selection in percentages and to specify what you want the fade factor to be — fade in begins with no amplification, then the sound slowly gets louder until it reaches full specified amplification; fade out is just the opposite. It starts with full specified amplification, and ends without any amplification.

Delay lets you delay the selected sound to create effects such as echo or reverberation. You can set the delay length, the amplitude of the delay and the amplitude of the final mixed sound.

Filter is very similar to an equalizer. Each slider on the equalizer is like a volume control for each frequency band range. The middle position on the equalizer is the 100 percent amplitude mode. It will change the band range below it. If you move the slider higher than midrange, the band amplification increases accordingly. Thus, if you move it to the three quarters position, the amplitude mode will be 150 percent, and the band's amplitude will be increased by 50 percent. Similarly, if you move the slider to the one quarter position, the amplitude mode will be 50 percent, and the band's amplitude will be decreased by half.

Double-click on a slider to modify its frequency range. When the dialog box appears, you can use the scroll bars to raise or lower its range, and the RESET button to revert it to its

original settings. Filtering takes a long time, so be prepared to wait when filtering sound...a very long time. Turn down the brightness control, leave a note on the Mac, go have supper, watch a couple of late-night movies and catch a nap.

Mix lets you mix the Clipboard sound with the sound in the current active window. This function merges the two sounds together, starting from the insertion point.

Reverse is just what it sounds like. This reverses the entire or selected part of the sound.

Silence fills the selection with silence.

Smooth evens out sudden changes in the amplitude of sounds.

Another special feature of *SoundWave* is its pencil tool. With it, you can draw a sound wave just as easily as drawing in *MacPaint*.

You can play back sounds after you have edited them by simply pressing either the Play Sound or the Play Selected icon. There is also an easier way. Select PLAY OPTIONS from the Edit menu, and press on either or both check boxes. If you select the first, the sound plays after each change, and if you select the second, the sound plays while scoping.

SOUNDING BETTER

Want even more control over your sounds? No problem. *SoundWave* allows multiple sound windows to be open. You can have up to four sounds on the go. Also, it offers multi-window Cut, Copy and Paste of sounds. *SoundWave* uses the Clipboard while mixing sound, and it also allows you to play the sound in the clipboard. But it is missing a global scrap for sounds. This would enable you to copy paste sounds to and from the Scrapbook, which would allow you to have a large, easily accessible library of sounds, all in one file.

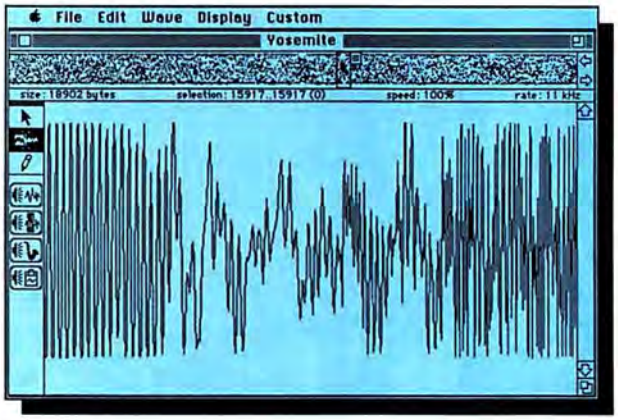
A Spectrum window shows the frequency changes in your sound. You can set what range you wish to display, and also whether or not the spectrum should be in three dimensions. Beginning at the starting point of the selection, the SPECTRUM command breaks the sound into several groups of 1024 bytes. The frequencies of the first group are plotted in the Spectrum window, then (providing three dimensions was selected) the next group is plotted to show frequencies after an amount of time. Each group's start time is shown in milliseconds, and the frequencies are shown in hertz.

Although the manual states ominously that only up to four Spectrum windows may be open at once, experimentation has proven the manual wrong. I succeeded in opening ten separate spectrums (five three-dimensional and five two-dimensional spectrums) for each sound out of the maximum of four (they were right there, at least). The spectrum pictures shown may be copied to the Clipboard to be pasted into the Scrapbook or another application, or they can be printed.

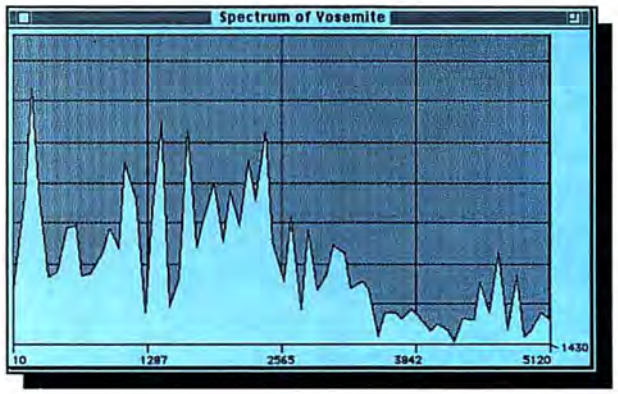
With the 128K or 256K ROMs, a zoom box is shown in the upper right corner of the window. Click this to toggle between a large window and a smaller window. Although a grow box is not shown, you can drag the bottom right corner of the Spectrum window to resize it.

The PRINT command allows you to print out the contents of either a Sound window or a Spectrum window. By selecting PRINT OPTIONS from the File menu, you can select several options specific to printing *SoundWave* files. It enables you to specify the horizontal and vertical scalings, which allow you to print more of the sound, while requiring less paper. That is, if you select 4:1 on both horizontal and vertical scalings, you would be able to print 16 times as much of the sound per page as you would have had you selected 1:1 for both, which will print the sound exactly the size as it was represented on the screen. You can also elect to print only the selected sound bytes.

When printing, you cannot, or at least should not, select draft quality, which is only for text, because *SoundWave* sounds and spectrums are graphic elements. Also, pagination is only evaluated at print time, so specifying to print from one page to another is useless, as you cannot



A simple recording would look like this in the sound window. The scroller or overview display is the condensed view of the sound. The size of the sound in bytes, the selection range, also in bytes, the speed and the sampling rate are displayed underneath the scroller in the information bar.



The amplitude of frequencies of one kilobyte sections of sound is shown in the spectrum, which displays the frequency in hertz along the horizontal axis, the amplitude of each frequency along the vertical axis and the time in milliseconds at the beginning of each section along the diagonal axis.

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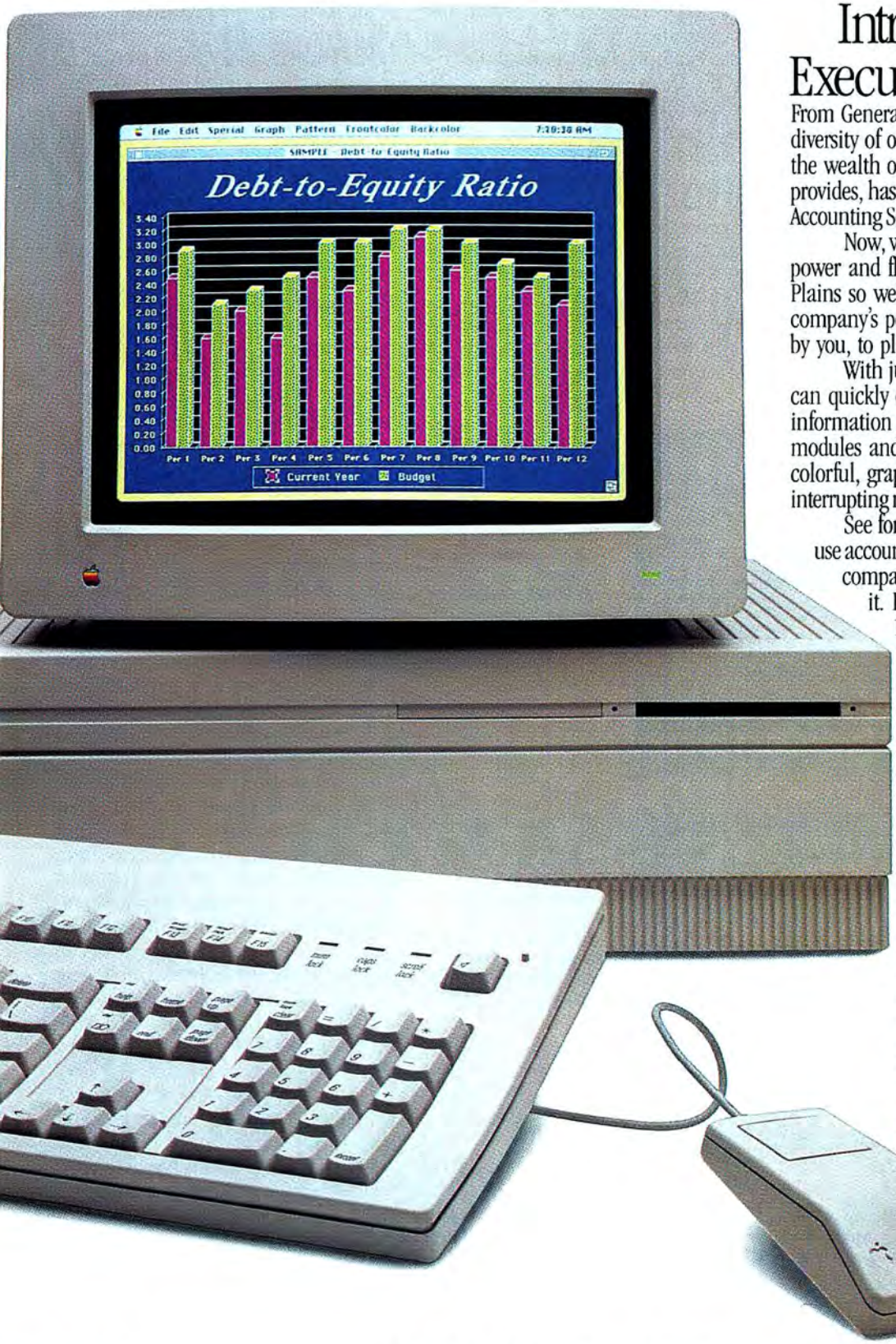


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FOR THE MUSICALLY INCLINED

Sounds digitized with *SoundWave* are compatible with *Studio Session* as long as you follow the correct steps. A *Studio Session* sound must be sampled at 11 kHz. If you don't know what the sampling rate is, look at the fourth item on the information bar (the row of numbers under the Overview display). If the sampling rate is not 11 kHz, you can change it by choosing RESAMPLE in the Wave menu. Also, if you just opened another prerecorded sound, and you are sure that you sampled your sound at 11 kHz, check the ASSUME RATE option. If it is not assuming the sound's rate as 11 kHz, press the button to select it as sampling the sound in this way.

A sound to be used in *Studio Session* must also fall into one of the two categories: looped or unlooped. In looped sounds, the beginning is played, then the part to be looped is called repetitively for the amount of time specified in *Studio Session*. That is, for example, you can hold down a key on an organ and receive a sustained voice, not lowering in pitch, volume and so on.

To define the loop in an instrument, select the part of the sound you wish looped. In *Studio Session,* looped notes have the beginning sound, or the attack, and the loop, which is the part that is played repetitively. If you do not select all of the sound after the attack, the remaining sound will not be played when the instrument is. Also, sounds must have an attack, so you cannot select the entire sound. You can, however, select the sound after the first bit, which is essentially the same as selecting all of the sound. The number of bits in the loop of the sound must be greater than 1480 bytes long.

If you try to play the sound with the loop as a *Studio Session* instrument (the PLAY INSTRUMENT button is the icon with the picture of a saxophone on it), you'll get an error message. To see what your selection is, look at the second group of numbers in the information bar. The first pair of numbers shows at what bit your selection begins, and where it ends. The total number of bits selected is in the brackets to the right. The loop's selection cannot exceed 32,767 bytes, because *Studio Session* stores its information in such a way that the bits in the loop cannot exceed this number. To test whether or not your selection is legal, press the PLAY INSTRUMENT button. If something is wrong, an error message will be displayed.

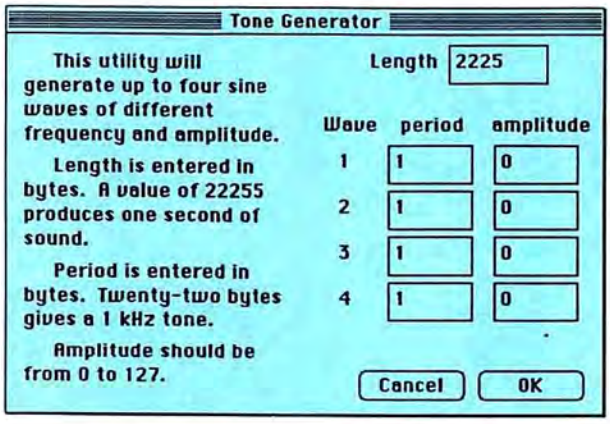
Another test you should make is to hold down the Shift key and press the PLAY INSTRUMENT button. Doing so will cause the instrument to play repetitively until you release the Shift key. There will probably be a few clicks in the sound, but these can be fixed.

To fix them, you should go to the beginning of the selection by choosing the SHOW BEGINNING function. Then inspect the beginning of the selection. If CONNECT THE DOTS is not on, select it from the Display menu, because it makes a lot more sense out of the clumps of dots than if it is not turned on. Notice any high frequency ranges in the area (high frequency ranges are characterized by the very high peaks of the wave). Select the middle of the highest point on a specific peak of sound. The highest is the best. Now, select the SHOW END function. At the end of the selection, hold down shift and click on the point of a peak that matches the one you selected previously. Try the sound by pressing the PLAY INSTRUMENT button while holding down the Shift key. It may take some trial and error, but this is an effective way of cleaning up your loops.

Unlooped instruments are not called more than once per note. They make their sound, then they die out. Essentially, they are just the *SoundWave* recorded sounds played for a specified number of beats. If the number of beats exceeds the length of the sound, it dies and is in silence



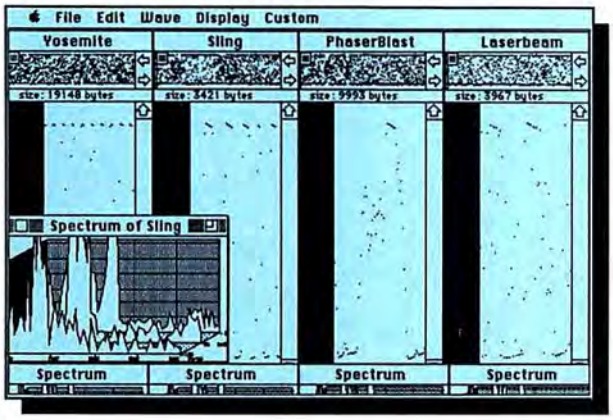
The Studio Options dialog shows and allows you to change the note and octave that the sound you recorded was playing. You can also specify whether your sound is to be looped or not. This is only useful if you plan to save the sound as an instrument.



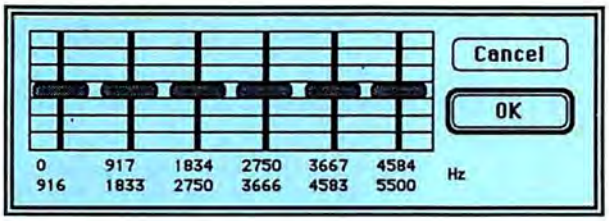
This is an example of a sound editing utility you can make for *SoundWave.* It is a simple tone generator included with source code on the disk. If you choose, your custom items can be much more elaborate.

for the remainder of the note. If the number of beats is smaller than the length of the sound, it is simply cut off in the midst of playing.

You can set the sound as one of these categories by choosing STUDIO OPTIONS in the Edit menu. You also may specify what note the instrument was playing while it was being digitized. For example, if the instrument was playing a high C sharp or D flat — they are the same (one octave above Middle C) — you would choose the C sharp or D flat radio button, as well as the 4 octave button.



A maximum of four sound windows can be opened at a time. They can be put in a tiled formation and their waves roughly compared. As you can see here, the bits of sound in the scroller squeeze together as you shrink the window. The manual says that you can only open four Spectrum windows. I opened five, although the screen did get a bit cluttered.



The digital file filter dialog looks and acts much like an equalizer. Each slider is a control for the frequency band underneath, amplifying the sound from 0 percent to 200 percent. Double-click on a slider to modify the band range.

FOR THE PROGRAMMER IN ALL OF US

A special feature for programmers using *SoundWave* is the ability to write your own custom functions for sound editing. Let your imagination run wild. These features can be accessed from the Custom menu on the far right of the menu bar. They either read the data in the sound wave and model it in some other manner (for example, this is what the Spectrum function does), or they should alter an existing sound, like most of the other features of *SoundWave.*

To create a custom item, you'll require two things. The first is a programming language able to create specific resources. Most high-level compiler languages have this feature. Use this test as a guide: If the language can create FKEYs or any definition resources (MDEFs, CDEFs, etc.), it can create custom items. Interpreted languages lack this capability.

Some languages able to create such a resource are: *TML Pascal, Macintosh Programmer's Workshop (MPW), Lightspeed C* and *ZBasic.*

The second item you'll need is a copy of *ResEdit,* the resource editing utility. You can get it from most public domain libraries, and it also comes in a package called the *Macintosh Development Utilities,* sold by APDA (290 S.W. 43rd Street, Renton, WA 98055; (206) 251-6548). If you're a serious programmer, their $20 membership fee is worth it.

The custom item's code, when compiled, is called a "swci." Make sure that swci is all lower case. The swci stands for SoundWave Custom Item, and that's exactly what it is.

After the swci has been compiled, use *ResEdit* to move it into the *SoundWave* program, along with any other resources it may need (ALRTs, DITLs, CURSs, etc.), giving them resource ID's that are unique in the program. And, although I hate to flog a dead horse, make sure that you are using a *copy* of *SoundWave.* It is not copy protected, so it is easy to do. Never, never use an original copy of any program with *ResEdit.* Playing with it is a dangerous game and could be fatal for you and the Mac.

A tutorial in the manual shows how a custom item already in the program was formed and explains how it functions, using the source code as a guide. I recommend that you read this tutorial if you are going to attempt to make your own swci resources, even if you don't read the rest of the manual.

As well as being able to create your own custom functions, you can also get access to sound files from your own programs. Source code comes with the program, and a tutorial in the manual explains how easily it can be done. There are several Pascal commands accessible, but they are easily coerced into libraries for other languages.

When you're done recording and editing your sounds, you have many options for saving. You can save the sound as a standard *SoundWave* file, a numeric file (a text file that can be read by spreadsheets, BASIC and so on), a resource file (for programmers' use in their own applications) or as a *Studio Session* instrument. Text formats take up much more disk space (up to four times as much) than the normal *SoundWave* format. As in *SoundWave*'s predecessor, there should be a compression function so that memory can be saved on the disk.

THE FLIP SIDE

Although *SoundWave* is a vast improvement over its predecessor, there are still quite a few problems. Several of the functions of *SoundWave* take much longer than the same functions in *SoundCap.* For example, a 400 percent amplification of a 7000-byte sound recorded at 11,000 samples per second required about 13 seconds, while the same

Sound Off: A Comparison

This table shows a comparison between *SoundWave* and *SoundCap*. As you can see, some features in *SoundWave* take a much longer time than the same feature in *SoundCap*. All tests were with 7000-byte sounds.

7000-byte Sound at Sampling Rate of 11,000 Bytes Per Second	SoundWave	SoundCap
Greatest Filter Time (from Lowest to Highest Amplitude)	5 minutes 26.26 seconds	N/A
400 Percent Amplification	13.08 seconds	4.93 seconds
Smooth Sound	1.35 seconds	N/A
Mix in 7000-byte Sound	2.22 seconds	1.03 seconds
Studio Session Compatibility	Yes	Yes
Compression Time	N/A	2.92 seconds
Disk Space Saved as:		
SoundWave/Cap	7318 bytes	7000 bytes
Compressed	N/A	6092 bytes
Resource Format	7318 bytes	N/A
Text Format	25,000 bytes	N/A
Spectrum	2-D, 3-D	2-D (real time input comes from box, not saved file)
Time (from Low: 10 kHz to High: 5120 kHz)	2D: 15.42 seconds 3D: 46.83 seconds	N/A

amplification in *SoundCap* took only about 5 seconds.

Sampling is a problem as well. *SoundWave* should scale the sampling of the sound to fit into files of other sampling rates. That is, when you cut a part of a sound out of one file to transfer it to another of a different sampling rate, the bits of the sound are left the same, but the sound is pasted in at the same ratio as the file. Therefore, when you play the sound, the part you pasted in is usually either played too quickly or too slowly. You have to change the Resample function to whatever the other sound was recorded at before copying. Remember what you sampled the sound at so you don't get into any trouble with this.

If you ever need to use any of the sound effect functions included with *SoundCap,* you're out of luck unless you are a programmer or have *SoundCap* itself. Most of them are not included in *SoundWave.* I especially liked Flange, but where is it in *SoundWave*? Nowhere to be seen. The Echo Chamber spectrum is gone as well. These useful and sometimes neat functions should have been programmed into *SoundWave.* But they weren't. So, if you want them, you have to either program them into a custom function yourself, or ask Impulse for a copy of *SoundCap.* If you are a registered user, you should be able to have access to previous versions. In this case, you'll have to pay $25, though, a fair price.

Another problem, though not as great if you are smart and read the manual, is that there is no on-screen help. If you have any questions or problems, you have to look it up in the manual (no index, of course). This takes time which could be spent working on *SoundWave.*

THE FLOP SIDE

One of the worst problems with *SoundWave* is that it is not compatible with *Switcher.* You can mount it with *Switcher,* but when you try to open a file, either the Macintosh crashes or you end up with a Memory Full! or Terminated by a System Error! alert. To top it all off, when you look at the About dialog to see how much of a megabyte of memory remains without *Switcher,* it shows that only about 212,480 bytes have been taken up, leaving 787,520 bytes to sit and vegetate. Even in a worst-case situation, there were at least 400,000 bytes left. When used with *Switcher,* only about 12K remains in RAM (*Switcher* doesn't use up that much memory). Go figure.

ONE FINAL NOTE

SoundWave allows you to create excellent digitized sound with the ease of use and the wide selection of features and capabilities of a more advanced digitizing system. It has features for the best, and for the rest of us. In fact, there is only one thing that the Impulse Sound Digitizing System does not possess that other high-tech digitizing systems do. The price.

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MACUSER RATING

SoundWave ★★★★

Follows Mac Interface	■ ■ ■ ■ ■
Printed Documentation	■ ■ ■ ■ □
On-Screen Help	None
Performance	■ ■ ■ ■ ◧
Support	■ ■ ■ ■ ■
Consumer Value	■ ■ ■ ■ □

Comments: An inexpensive, useful sound recording and editing utility. **Best Features:** Low cost; allows you to customize your own menu for any functions you desire (and can program); Undo function added; allows multiple windows; several different file formats as well as a Pascal programming unit so you can access your sounds from other programs. **Worst Features:** *Switcher* incompatible; sets the sampling rate to 22 kHz after many editing functions, including Cut/Copy/Paste and Filter; doesn't have many of the functions possessed by *SoundCap,* and those that it does possess, it executes much more slowly; lacks an index in its manual; no data compression. **List Price:** $199.95 ($25 update *SoundWave* from *SoundCap*). Published by Impulse, 6870 Shingle Creek Parkway, #112, Minneapolis, MN 55430; (800) 328-0184. Requires Mac 512K+. Not copy protected.



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Having a Crystal Ball

If you've been harboring a secret yearning for a good shoot-'em-up on the Mac, Crystal Quest is the game for you.

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Until recently there were virtually no Mac-specific arcade-type games, mostly because the mouse doesn't seem to lend itself to hit-and-run maneuvers. I worked for *Electronic (Computer) Fun* and *Electronic Games (Computer Entertainment)* magazines, and frankly, have missed being able to sit down to a nice, mindless shoot-'em-up on my Mac. *Crystal Quest* has changed all that. It's a real arcade shooter, enhanced by much better sounds and smoother action than that of its predecessors on other computers; it's better than its immediate Macintosh shareware ancestor, too. And it runs in glorious color on the Mac II. So much for productivity.

NOT THE SAME

Crystal Quest is the new and improved, commercial version of the shareware game, *Crystal Raider*. Having played both versions, I am astonished that anyone could have seen a good game in the original; *Crystal Quest*'s publisher, Greene, deserves some kind of prize for x-ray vision. The screens are the same in both versions, more or less, and the graphics are very similar; everything else, everything that makes a game like this a pleasure to play, has been changed. The original action was jerky and appeared to work on a grid, so that movement was possible only in straight lines and at discrete angles. (The opening demo will show you what I mean; it seems to have been carried over without change.) The original's sounds were of the deedle-deedle, beep, bump variety; there were no instructions; and to get out of the program you had to turn your Mac off. If you played *Crystal Raider* and hated it, don't let that prejudice you. Just give *Crystal Quest* a shot — so to speak.

THE PROGRAM

Gameplay, as we called it in the old days, is quite straightforward. (Everything you need to know is included in the handy on-screen instruc-

BY LOUISE KOHL

MILTON DERMS


Score : 3083125
Wave: 40 Time: 00:08
8100
7400
4700

Having a Crystal Ball



Crystal Quest's opening screen in glorious Mac II color. Notice that you can skip the demo and instructions and plunge directly into the game.

tions.) You are represented by a white filigreed round thing that looks like an old New York subway token (the kind you could put a chain through). Your job is to avoid or shoot the nasties while picking up all the diamond-shaped objects on the screen. You need to pick up all the cherries you see, too; they represent smart bombs, which become necessities at the higher levels. There are also numbers (usually four-digit) lying around loose; running across them adds that number to your score. And every once in a while a large "crystal" comes out and bounces around the screen. These are worth between 10,000 and 50,000 points — you don't know exactly until you catch one. When you clear the screen, a gate opens at the bottom that you have to navigate into (the sides are lethal), in order to proceed to the next screen. Like all good arcade games, there's a time bonus if you beat the clock: 500 points for every second you save: 10 seconds for Wave one and an additional 5 seconds for each wave after that. If your peripheral vision is good, you can watch the clock in the upper righthand corner. If not, you'll have enough to look at and worry about anyway.

Just about everything that happens on the screen has a sound attached to it. As the bad guys come out of their gates on opposite sides of the screen, you hear a somewhat glottal "lidden." You pick up a cherry to "Wheeee!"; loose numbers to the accompaniment of a self-satisfied "Yeah!" And when you successfully exit, you hear something like the sound someone might make on having ice cubes dropped down her back.

The sounds are so good you could almost play blindfolded — if it weren't for the mines. They don't make any warning sounds; they just sit there, lethally silent, waiting for you to make a wrong move and run into them. The mines and diamonds are randomly distributed for each screen, and the distribution changes each time you play. This is definitely a twitch game, but not a pattern game, which is one of the things that contributes to its addictive appeal.

And make no mistake about it, if you like arcade-type games at all, *Crystal Quest* will start taking up more and more of your time. Otherwise solid adult members of their communities will start comparing high scores (the office high score is over 3.5 million) and how fast they can clear the first screen (4 seconds on a good day). And if they can't find people in their immediate vicinities, they've been known to start rather substantial threads on the electronic services.

THE PLAYERS

You, the cherry bombs and the intermittent crystals are the only benign objects in this game. The mines are deadly, the gates are deadly and just about everything that comes through the gates is lethal. There are 12 types of nasties, worth anything from zero to 10,000 points. The gen-



You are the white medallion slightly to the right of the middle of the screen. There are 2800 points to your right, but trouble brewing from the relentless Parasite coming up from below.

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Having a Crystal Ball



You're surrounded by "Boingers," a Husket, a Parasite and the ubiquitous mines. Technically speaking, this is being caught between a rock and a hard place.

eral rule to keep in mind is the more points they're worth, the harder they are to kill or avoid. In fact, there are two you can't kill at all by shooting at them. Guess how much they're worth. (Smart bombs kill everything in sight, but should be hoarded as much as possible.)

All of the creatures have names, but you won't use them. You'll find yourself giving them nicknames of your own. You'll also find yourself developing your own personal enemies — and you'll always find some annoying person who says, "Those? Those are *easy*!"

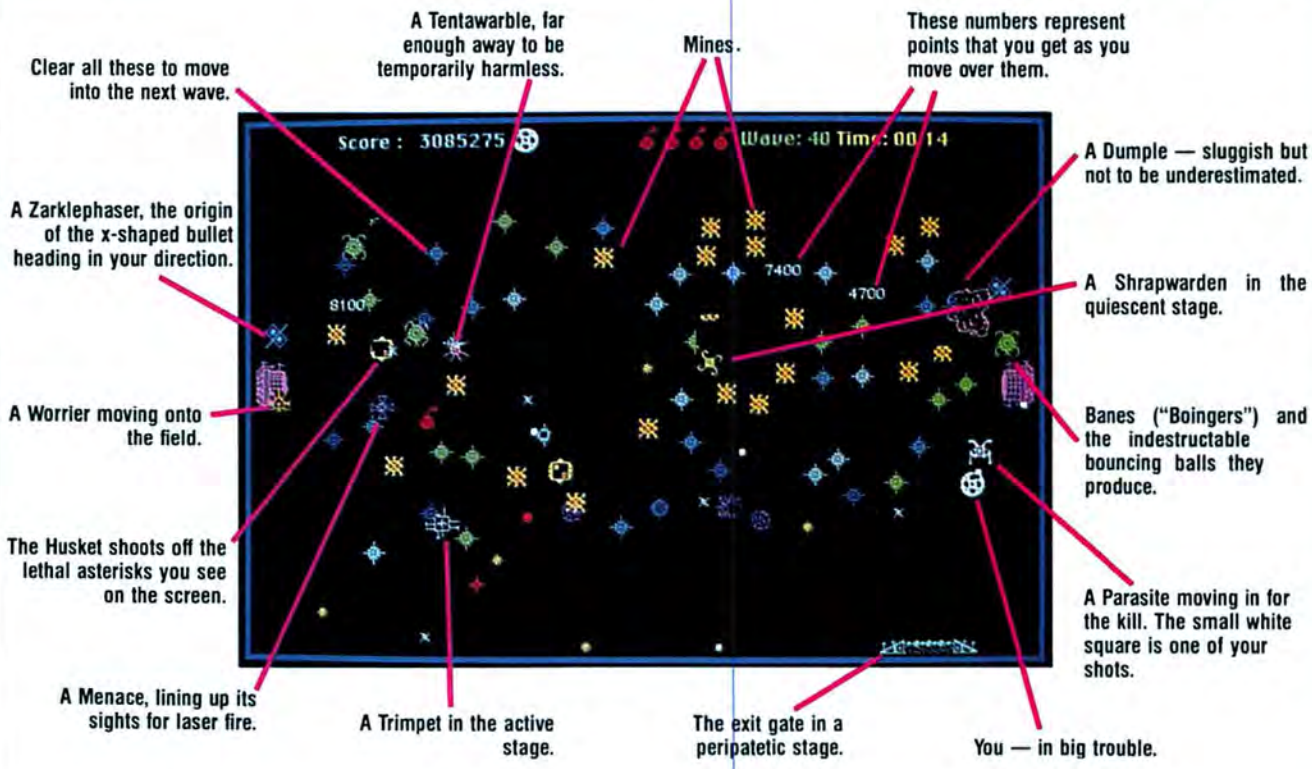
Here's a quick rundown of the enemy troops, in ascending order by points:

Trimpets (0): Trimpets look like manic video cameras. They don't shoot, but they can't be killed, either. Shoot them and they change shape and "hibernate" for a while. They're just as lethal (but not as ambulatory) in their dormant state and can come back to life at inconvenient times.

Annoyers (25): These guys look like the mushrooms in *Fantasia* and they move just about as well. They don't do anything *but* move, but they do tend to move *at* you, if you see what I mean. You can avoid up to three pretty easily, but when they gang up, you'll have to resort to brute force.

Worriers (50): These holdovers from some *Space Invaders* clone shoot at you. They fire off about three shots at a time, all heading in different directions. Avoidance is possible, but retaliatory fire is better.

Pests (100): Pests look like TVs with cracked screens. They have an annoying habit of dropping extra, cross-hatched shaped mines — with an unfortunate squelching sound reminiscent of the less pleasant bodi-





This is an atypical Wave 40 screen — there aren't nearly enough of the enemy in sight. Obviously, they're trying to lull you into a false sense of security. Given the ratio of lives to smart bombs, our advice is to reach for the "fire button" (space bar).

ly functions. If you die before finishing the screen, the mines disappear. But they'll be back with more.

Zarklephasers (150): Looking like windmill blades detached from the mill, these guys shoot off barrages of x-shaped bullets. They are also known to kamikaze.

Huskets (200): Shaped something like a fancy Christmas tree ornament, Huskets shoot asterisks at you. They, too, fire in more than one direction at once. (Which is more than you can do; see below.)

Tentawarbles (200): (Where *did* they get these names?) Tentawarbles look like something you were forced to observe through a microscope in high school biology. They tend to make sudden rushes at you. They'll try to fake you out occasionally by backing off, but don't be fooled.

Menaces (250): These look something like an Army Sharpshooter medal and emit laser beams — long laser beams or short; it depends on how much energy they need to get to you. While most enemy fire stops short if you're passing through the escape gate, Menace fire can follow you right in.

Banes (300): Around here, Banes are referred to as "Boingers." They're frog-like characters who drop balls that bounce around maniacally, making a maddening "Boinnnnnng." The balls, to no one's surprise, are also deadly. The frogs can be dispensed with by shooting; there's not a thing in the world you can do about the balls — unless you want to waste a smart bomb. Boingers seem to return in greater numbers after you've wiped out all their friends like that.

Parasites (1000): I call these "M's." That's what they look like. They are extremely difficult to avoid and tend to come at you from both directions at once. I hate them.

Dumples (2000): These guys are amorphous blobs that first appear in Wave 5. They are slow moving and lethargic, but can suddenly dart very quickly at you. It takes more than one shot to kill them, but shooting at them usually moves them out of your way.

Shrapwardens (10,000): Shrapwardens look like Ninja's sheriken and are doubly lethal. Like everything else, you die if you hit one; you may also die if you shoot one. Shooting them produces 360 degrees of asterisks. The good news is that you don't have to die every time (see the sidebar for help). The bad news is that they're *real* easy to hit inadvertently, giving you no time to dodge. I'm not really fond of Shrapwardens.

THE GAME

Before starting the first game, make life a little easier by disabling *QuicKeys, Pyro!* and *MultiFinder.* Each of these has its own unique problems with *Crystal Quest.* Running *QuicKeys* means that you won't be able to exit gracefully with COMMAND-Q; in fact, you won't be able to exit gracefully at all. If you've paused a game long enough for *Pyro!* to take over, you return to find that you have both your "subway token" and

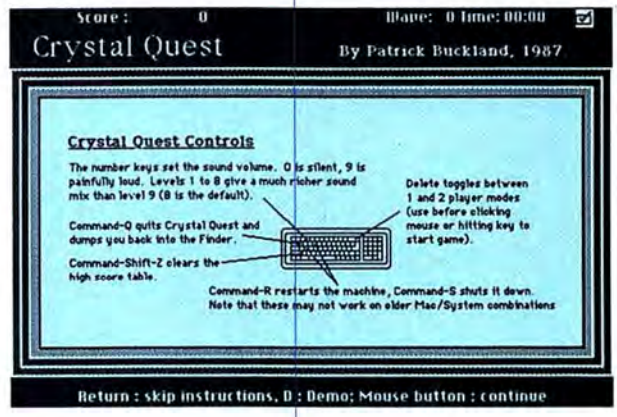


You may seem to be safely in the open here, but the red circle will continue to expand. Your only hope is to slip through the cracks as the lethal "stars" move further apart.

Having a Crystal Ball

a cursor arrow on the screen. Both will move with the mouse, but without any reference to each other. Most disconcerting. You may find that the game has gone negative, too — white background and black everything else. It makes a change. And let's just say that *Crystal Quest* isn't *MultiFinder*-friendly (or vice versa).

There are three basic approaches to the game: Hawk, Dove and IRT (also known as the Goetz approach) — or shoot always, shoot never and shoot only when really forced to by



***Crystal Quest*'s on-screen instructions are clear and to the point. They cover everything but how to stay alive.**



The crosshatches are mines laid by the busy little TV characters towards the bottom of the screen, left and right. They've been uncharacteristically generous here and haven't blocked the open exit gate.

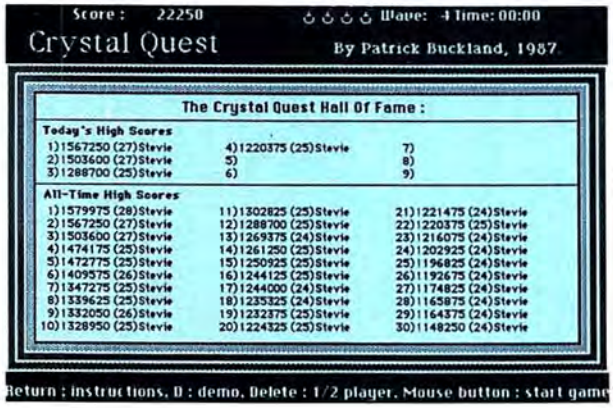
ble.) If you can stand taking out crystals as well as threats, shoot into the gates on the right and left sides of the screen as you approach; you can often wipe out danger before it appears. When all else fails, you can always rely on the smart bombs. However, you only start with three of these, and you never know how many will appear to pick up. And they're wasted on the early waves; you'll need every one you can get your hands on after Wave 20.

Choosing when to shoot means circumstances. The second one seems to work only for Michelle, a 14-year old friend of mine. If you're 15 or older, opt for one of the other two.

Both have virtues and limitations. Coming out with guns blazing, so to speak, minimizes your chances of being taken by surprise. Unfortunately, you can also shoot and destroy crystals, losing potential points. (However, on the higher waves, chasing down the crystals is a mug's game; they lure you into all sorts of trou-



Two Menaces collaborate, zapping from two directions at once. They haven't yet noticed you're at the top of the screen with only a single Husket for company.



The Editor-in-Chief ruined his record of dying only on waves 24 and 25 by finally making it through 28.

learning to aim, which is not as easy as you might think. You can only shoot in the direction you're moving, so if you're stationary or something blindsides you, you're minus a life. Bad guys often gang up and swarm at you, too, leaving you no room or time to turn and aim. On the other hand, there's a certain satisfaction to finishing a wave having outwitted rather than outmuscled the enemy. And remember, you may have smart bombs, but the things you're fighting aren't so dumb. They

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If you're one of those people who likes learning everything the hard way, read no further. This is a *vade mecum* for folks who believe that forewarned is forearmed.

- If you move quickly enough, you can sometimes clear a wave before the nasties get onto the screen.
- In general, your best move is to sweep up and across the top first; you'll have to come back to the bottom to exit anyway, so there's no reason to duplicate moves.
- Dumples will sometimes obligingly crumple up and disappear after being hit once. Sometimes.
- The faster you move, the harder you shoot; the converse also holds.
- Starting with Wave 26, the exit gate becomes peripatetic. It usually keeps moving in the same direction from the center as long as you're on the same wave. Note the direction and try to finish the wave as close to the gate as possible.
- There is life after 40. A member of the *MacUser* production staff has cleared the 40th wave and moved on to bigger and better things.
- When you first begin playing, it's perfectly all right to hit the Tab key (PAUSE) and study the screen.
- Menaces are stationary while producing laser effects. Zap them then.
- Tentawarbles tend to leave you alone if you keep moving.
- If you're on the move while detonating a smart bomb, you'll come out of the explosion moving faster than ever. Be sure you're either stationary or moving in a safe direction. You can only have five "friendly fire" bullets on-screen at a time. Don't plan on any machine gun effects.

have an uncanny ability to aim or dash just in the direction you're *thinking* about moving in.

JUST A PIXEL TO THE LEFT

All it takes to pick up the diamonds and crystals is the barest touch. (That's all it takes to die, too.) This means that if the ravening hoards give you breathing room, you can negotiate some pretty delicate maneuvers to pull diamonds from the rough. They are very often snuggled among mines; and if they aren't, rest assured that a few Pests will appear to rectify that situation. Crystals will pause in the gate, half visible, and you can brush by and pick them up before they break loose and go richocheting all over the place. Two warnings about this procedure: lethal characters often hide behind crystals just waiting for you to try it; and it doesn't work consistently well after about Wave 10.

Crystal Quest works on an "inertial mouse" principal, so pulling out of dives and doing fancy loop-the-loop maneuvers around mines and such takes a lot of practice. The tendency is to keep going in the original direction — only a pixel or two, granted, but that's often more distance than you can safely cover, especially on the higher waves where there are more mines and more things shooting at you.

IMPROVING THOUGHTS

As good as *Crystal Quest* is, it could be even better. The only genuinely annoying feature — aside from the nasties — is that you never know how many lives or smart bombs you have left. There's a display at the top center of the screen, but it only counts to four in each case. If you're one of those people who can mentally add up numbers on freight cars as they pass, you won't have any problem with this. The rest of us, however, are playing in the dark on the higher levels, where it becomes vital to know whether you're better off risking a life or nuking the screen into submission. (One *MacUser* contributing editor feels that using up all your lives while you still have bombs left is the first sign of bad play.) Most games of this type have a limited display area for icons representing lives and ammo; however, this is more limited than most. A better idea would be to have just one icon in each case, followed by numbers.

IN GLORIOUS COLOR

Crystal Quest on the Mac II is

something you shouldn't miss. Everything has its own color, which makes mines and bad guys much easier to spot out of the corner of your eye. While the screen is larger, the display is the same size, but it gives the illusion of having more room in which to maneuver. The feeling around here is that gameplay *seems* faster and better, but that may just be because the color ameliorates the eyestrain you usually get around Wave 21.

I don't recommend you run out and buy a Mac II just to play this game (I don't recommend you buy a Mac II unless you're planning to run General Motors), but you owe it to yourself to borrow or beg some time on one — say, just long enough to run up a 1 million-plus score.

How you react to *Crystal Quest* depends almost entirely on how you feel about arcade games in general. If you've always thought they were a complete waste of time and energy, you won't want to try this one. (And you have my condolences.) If you remember games like *Oil's Well, Omega Race* and *Centipede* with fondness, get *Crystal Quest* as soon as possible. And let me know what your high score is; if you show me yours, I'll show you mine.

LOUISE KOHL IS THE EXECUTIVE EDITOR OF MACUSER AND AT AN EMBARRASSINGLY ADVANCED AGE ONCE HELD THE ALL-TIME HIGH SCORE ON OIL'S WELL FOR THE COMMODORE-64.

MACUSER RATING

Crystal Quest ★★★★½

Follows Mac Interface	■ ■ ■ ■ ◧
Printed Documentation	None
On-Screen Help	■ ■ ■ ■ ■
Performance	■ ■ ■ ■ ■
Support	■ ■ ■ ■ □
Consumer Value	■ ■ ■ ■ ■

Comments: This is the first old-time arcade game specifically for the Mac. **Best Features:** Smooth gameplay and non-repetitious screens. **Worst Feature:** You never know exactly how many lives or how much special ammo you have in reserve. **List Price:** $39.95. Published by Greene, 15 Via Chualar, Monterey, CA. 93940. (408) 375-0910. Requires 512K+. Master disk protected.

Surgeon General's Warning

This note is being written at one of the Macs in the Palo Alto Crystal Quest Rehabilitation Center. It's offered in the hope that others may be spared.

1. Do you play *Crystal Quest* before breakfast?
2. At the office with the sound turned off?
3. Have you ever screamed or yelled loud enough to startle people around you while playing?
4. Have you ever seen the sun both set and rise during one *Crystal Quest* session? Or vice versa?
5. Do you know the high score of your five closest friends?
6. Do you know enough not to shoot Shrapwardens from up close?
7. Do you always go after big crystals in levels 1 to 10 when life is cheap (15,000 per)?
8. Can you play with your eyes closed (but the sound turned up loud)?
9. Do you seek out color Mac IIs, because everything moves slightly slower and you can score higher? Did you buy your color Mac II for this reason?
10. Would it take a team of wild horses to part you from your *Crystal Quest* disk?
11. Can you easily avoid the shots the nasties fire (as well as the nasties themselves)?
12. Do you always ambush and shoot Menaces when they stop to fire their laser beams?

If you can honestly answer Yes to six or more of these carefully posed questions, QUIT Crystal Quest (that's COMMAND-Q for those of you who have never had need for that command), select SHUTDOWN from the Special menu, turn everything off and seek immediate help.

Don't feel that a basic antipathy to games can prevent this addiction from happening to you. *Crystal Quest* is dangerously addictive and even a brief exposure can be enough. Five games often means you're hooked.

This all sounds fanciful, but it's true. I know, it happened to me. Don't say No to *Crystal Quest. — SB*

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Win One for the Clicker

Remember the football league of your childhood: The stats, the pages of glorious stats that it involved. Now Pro League Football brings back the pleasure without the pain.

COMPUTER GAMES ARE, IN AND OF themselves, lonely challenges. Regardless of the hours you've spent assembling a robust party of adventurers to defeat a foe or the skill attained maneuvering a MiG jet fighter into a kill shot or the savage beauty and precision of your end game in chess, there is no sense of comradeship; no shared experience with the ultimate computer.

TEAM PLAYERS

Pro League Football shatters the one person/one machine shackle by presenting a total strategic and statistical sports simulation that encourages real-time participation by up to 28 coaches. It's not an update of the popular *Mac Pro Football,* by the same author (*MacUser,* March '87). That game centered on the "down on the field" tactical aspects of professional football. And as innovative as it was, *Mac Pro Football* tended to become hour-long point and click sessions with only an end-of-game printout to show as a record.

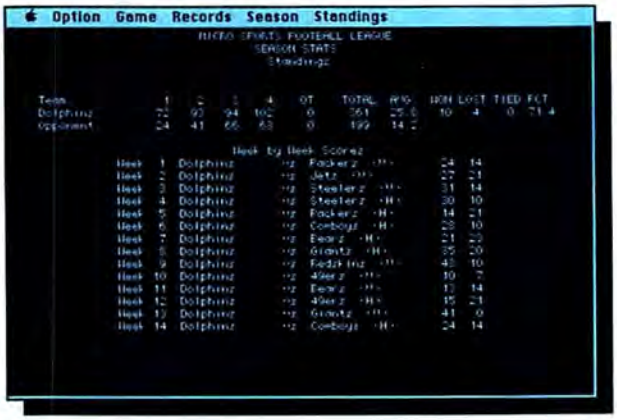
This game is entirely different. Here's what the *Pro League* system does:

- Creates leagues, conference and divisional structures.
- Runs games by using one of five different game plans created by a coach or the computer.
- Executes a game in as few as 9 minutes and in no more than 20 minutes.
- Puts end-of-game statistics in a pre-processor stat file.
- Updates statistics with a single mouse click.
- Displays and prints a record book of the top individual and team performances.
- Displays league, conference and divisional standings.
- Displays and prints scouting reports on teams and team match-ups.
- Prints blank master game plan sheets.

BY HARRY CONOVER


57
COACH

Win One for the Clicker



This is the 1972 Miami Dolphins Standings page from their team Stat file displayed in the *Stats Keeper* application.



This is the first page of the viewable and printable Record Book that lists individual and team performances.

SCOUTING NEW PLAYERS

The most obvious difference between *Pro League* and *Mac Pro Football* is the type of user interaction. *Mac Pro Football* revolved around you versus the computer in real-time. Many, many mouse-clicks.

Pro League Football takes a higher view of the contest by allowing you (or the computer) to create different types of game plans. The game plan is then used by the *Pro League* application to run the game. The variety of game plan options is the very heart of *Pro League.*

The notable exception to this hands-off attitude comes when you select the type of display (which determines the length of your game) and the number of quarters to play. If you choose less than a full game, you can use *Mac Pro Football* 2.0 to play the remainder of the game in real-time and have those stats updated as well. No other game gives you this type of option. Intervention and game-to-game compatibility such as this is totally unique in the gaming world.

The basic game plan metaphor begins with the *Scouting Report* application. Here you can see the individual and unit numerical ratings for your team and your opponent and get a printout of those ratings.

Then it's off to the *Game Plan* application. Its sole function is to print out a blank form of either the Standard — take a deep breath now — 84-category or Quick (41-category) game plan to be filled in by hand by a coach. Observations made from the scouting report on the strengths and weaknesses of your team and the opponent determine your answers to the questions.

THE KICKOFF

The *Pro League Football* application plays the games that the game plan calls for. It is in many ways the same as *Mac Pro Football.* It allows you to preset weather conditions, select your starting quarterback, direct a running play-by-play commentary to an ImageWriter printer and call the coin toss.

You determine how long a game takes when you pick the type of screen display you want to see. If you elect to see the Xs and Os execute each play, the average game will take 15 minutes. A simple play-by-play with no "graphics" will cause your games to fly by in about 9 minutes. You can change the speed of the game from a pull-down menu while the game is being played. Be prepared for some very fast text and graphics. The game is written in compiled *MS-BASIC* and moves along briskly.

The *Pro League* application offers the coach many game plan options. The hard copy hand-filled out game plan sheet can be entered manually at the keyboard. Or you can simply let the computer "look" at an opponent, automatically create a game plan and use that. Another method is to use an "existing" game plan. In this option, the computer looks at the most recent game plans for both teams (if they exist) and creates a new one. A generic game plan (which has a special suffix at the end) could also be used. Once a specific type of game plan is displayed, you can manually edit any of the 84 categories (have your manual handy).

As soon as both game plans are accepted and the coin toss won, the game begins. Unless you have selected to play less than a full game, you have no control whatsoever over the game. However, the game does have control over those watching it. Grown people have covered their eyes and refused to look at the screen as the game progresses.

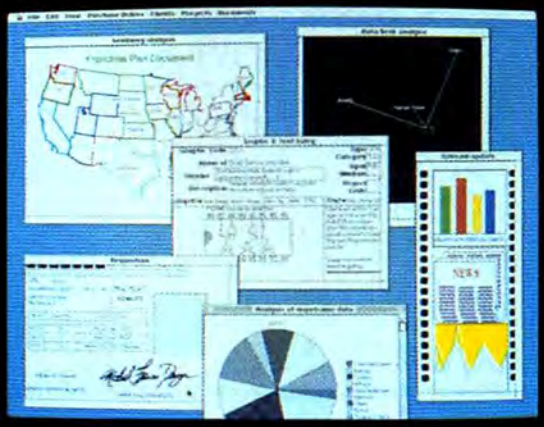
HUDDLING UP

The *raison d'etre* of *Pro League* is its ability to construct an organization that allows you to act as a League Commissioner and others to become coaches of teams which compete against each other. The game doesn't have to be played that way. You could just as easily construct your own league and play all the games yourself.

But the thrust of *Pro League Football* is the process of evaluating your

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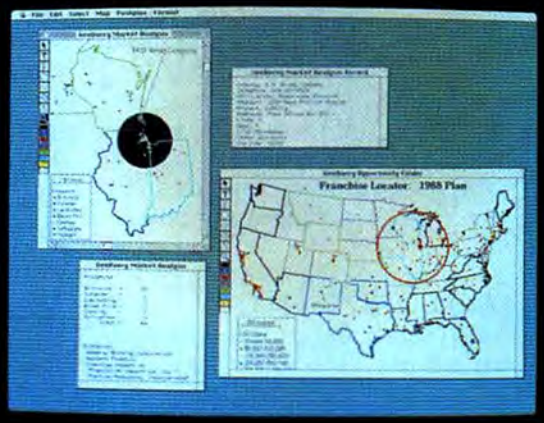
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Win One for the Clicker



The standings of a mythical *Pro League Football* league viewed from the *Stats Keeper* application.

resources, devising and refining your game plan and gauging the success or failure of your efforts against a human opponent. After playing for a while, you realize that this is art imitating life. You become involved in the subtle nuances of watching the games as game films, since they turn out to be practice for the next contest.

LEAGUE PLAY

All league and statistical manipulation is performed and viewed in the *Stats Keeper* application. Setting up a league requires some planning. You should determine the number of conferences in a league (you must have two conferences if you have more than 15 teams in the league), the number of teams in each division (five teams maximum in a three division conference) and their names. Correct spelling counts here.

After playing a game or a series of games (16 is the maximum) and directing those statistics to the Auto League file from within the *Pro League Football* application, you run the *Stats Keeper* application to update all statistics and standings.

Stats Keeper displays the updated offense, defense, special teams, year-to-date standings and schedule results for any team that has a specific team stat file. These team stat files should be created when the league is structured. An attempt to update a team stat file that does not exist will force you to create one.

Each team's standings statistics are broken out by scoring by period for both the team and all opponents they've played. The stats list the played schedule with week number, opponent name, venue and score.

You can check the updated league standings after they have been sorted, and write comments about each game in a Commissioner's Report. The next week's schedule of games (including a do-it-yourself odds line) can be typed directly into *Stats Keeper.*

And if all that wasn't enough, *Stats Keeper* contains a viewable and printable Record Book that lists the top individual and team performances from all games played.

CLOSE, BUT NO T.D.

Despite the game's speed increase (which some will find disconcerting when trying to follow the Xs and Os during play execution) — a result of being compiled instead of interpreted — *Pro League* still suffers from *MS-BASIC*'s quirky behavior running under HFS.

Be sure that all *Pro League Football* applications and files reside in one folder on the desktop. Do not try and put all your team files or your generic game plans in a folder within the *Pro League* folder. Neatness does not count here. Yes, you'll have a very crowded folder. Let's just call it "Being kind to *MS-BASIC.*"

To prevent accidental overwrite of an invaluable Auto League file, Team Stat file or Record Book make frequent back-up copies of those and put them somewhere else.

And while you can edit a game plan on the screen, you must work entry by entry. A game plan screen entry form would be a boon. While you can direct a running commentary on the game to your ImageWriter it would be nice to have it directed to a text file as well for review and archiving.

The manual, which was rewritten after the first printing was found to be typo-laden, still needs to explain how to use *Pro League* and *Mac Pro* in tandem. And with 52 teams in the game, some background on their identity in terms of performance of individuals would be very helpful.

THE END ZONE

With the imminent release of *Pro Draft,* which will allow you to create teams of the greatest all-time players, and *League Leaders* (a user-definable version of the *Pro League* stat files) to the *Pro League* system, the game will be far more complete. It comes on two 400K single-sided disks and only runs on Macintoshes with at least 1 megabyte of RAM. All RAM caches should be turned off.

The *Pro League* application is *MultiFinder* friendly, but you must set its size to 768K in the *MultiFinder* Get Info Size Box. Switching between *Pro League* and other applications while using *MultiFinder* results in improperly redrawn *Pro League* screens. *Stats Keeper, MSFL Stats, Game Plan* and *Scouting Report* are not *MultiFinder* friendly.

HENRY CONOVER IS CEO OF COMPUTER SIMULATED SPORTS AND FORUM MANAGER OF THE SPORTSSIG ON COMPUSERVE.

MACUSER RATING

MSFL: ProLeague Football ★★★★½

Follows Mac Interface	■ ■ ■ ■ ◧
Printed Documentation	■ ■ ■ ■ □
On-Screen Help	None
Performance	■ ■ ■ ■ ■
Support	■ ■ ■ ■ ■
Consumer Value	■ ■ ■ ■ ■

Comments: A total professional football simulation gaming system. Encourages people to play people, not the machine. **Best Features:** Blazingly fast automatic game plan execution; league organization; statistics galore. **Worst Features:** Quirky *MS-BASIC* behavior. Spotty manual. No LaserWriter support. **List Price:** $49. Published by Micro Sports, PO Box 15799, Chattanooga, TN 37415. (615) 870-9735. Requires 1M+. Not copy protected.

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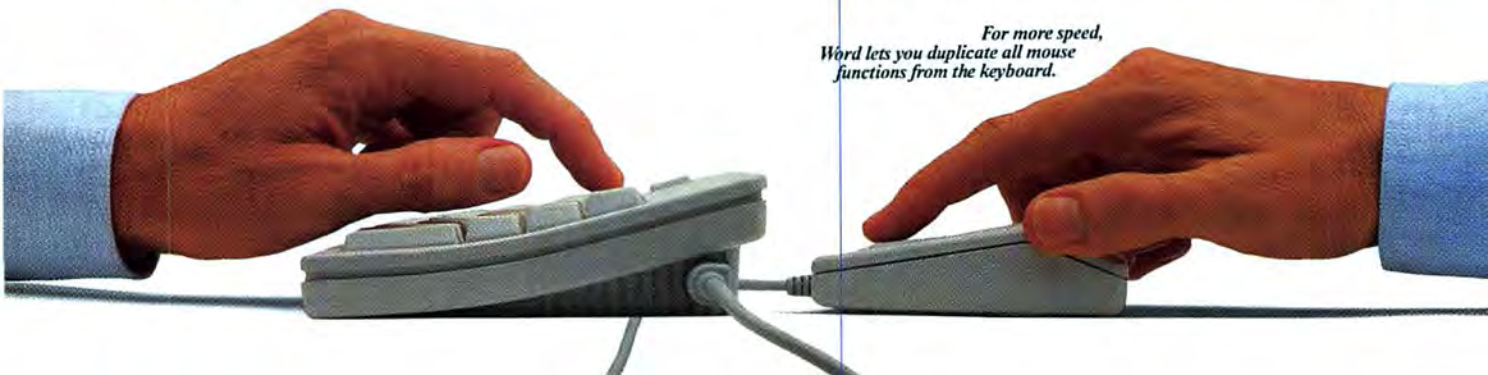
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Read it and Beep

Computers should be able to read typeset material easily and cheaply. And with Read-it! they can.

BY LARRY LOEB

ONE OF THE CLASSIC PROBLEMS IN computing is moving data in and out of the machine in a simple and economic manner. For input to mainframes, this typically meant rooms full of women typing data onto 80-column cards on 026 and 029 IBM keypunches. While this sort of thing provided gainful employment for typists, the problem of moving data has become magnified as users moved to microprocessor-based machines.

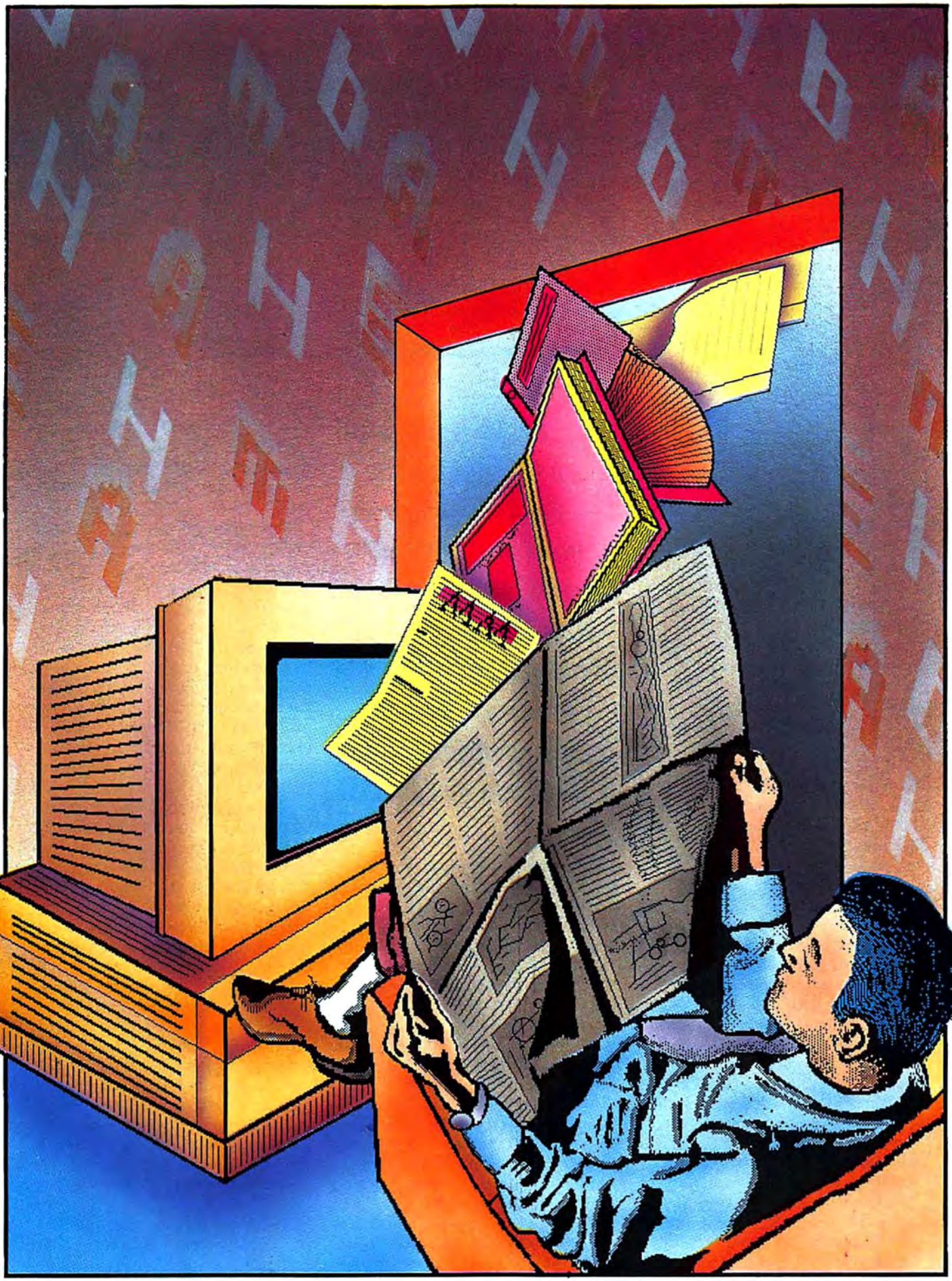
Users frequently need to manipulate large amounts of data. The data may be from disparate sources, but usually has been typed or printed on paper at some point. The micro user had to become his own data entry typist using his micro's keyboard. The alternative, scanning devices that could recognize the characters on the paper, have cost upwards of $10,000, putting them out of the reach of most users.

Olduvai has introduced a product that could change all this, however. It's called *Read-it!,* and is the first low-priced Optical Character Recognition (OCR) software that I am aware of for microcomputers.

Read-it! takes the output from either a conventional scanner (or, in a different version from the one reviewed, from a ThunderScan) that is stored in *MacPaint* or Tagged Image File Format (TIFF) and converts it into a simple ASCII text file containing what was written on the stored image. This is a non-trivial task, as we used to say in engineering school. Once the written data is in text form, it can be used by most programs one way or the other. Word processors, in particular, can accept text data easily.

Let's take a walkthrough of a session with the program. Before *Read-it!* is used, the control program supplied by the scanner manufacturer will have brought in the actual image and stored it in an appropriate manner (usually in a TIFF file format). One notable exception to this is the special driver that Olduvai has developed for the MacScan flatbed scanner by New Image Technologies. This SCSI scanner can invoke the program "on the fly" as the image is processed without having to go through the TIFF file intermediate storage stage. But let's assume that we are dealing with another scanner and the TIFF file is present.

Start by selecting the slightly misnamed menu choice OPEN PICTURE in the File menu to bring up a dialog box that lets you choose a file in the usual Mac manner. This dialog automatically allows the choice of *Mac-*



DIDIER CREMIEUX

Read it and Beep

Paint or TIFF files. When selected, the file is read in and displayed in its own window. If the file is too large to fit in the Mac's available memory, an error message will appear. Since a 300 dpi scan of a full page of text can run a megabyte or more, this may happen more frequently with a megabyte of memory than you'd expect. If it does happen, cut up the image, using the program that created it, into two smaller ones to be processed individually. Or get that memory upgrade you've been trying to convince yourself that you need.

The image can also be brought into the program via the Clipboard by pasting it into a New Picture window. The Clipboard can also be used to save and edit text that has been generated. In fact, Undo, Cut, Copy and Clear work *only* on text, not on the image you are analyzing. This appears to have been a design decision, and one I can't argue with too strenuously. Most operations will be on the resultant text, not on the image information.

The next decision is what to compare the image to. Olduvai supplies about 40 "type tables" with the program. These are the characteristics of various types scanned at 200 dpi by Olduvai, and represent most major typefaces. Examples of these typefaces are printed in the manual so that a first pass guess can be made "manually" by comparing the image and the type in the manual. To get the desired table, select LOAD TYPE TABLE from the Commands menu. The usual file selection dialog follows this action, and completes the routine setup necessary for processing.

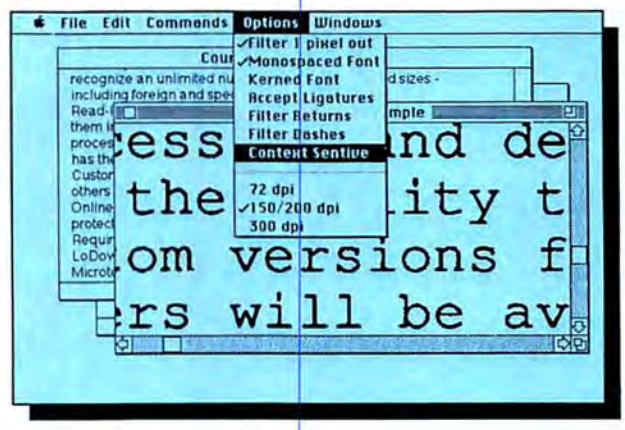
The processing elements are also found in the Commands menu. For a document with a totally unknown typeface, start with the LEARN command. Select an area of the image with the mouse to operate on. The program attempts to recognize each character. A small dialog shows the image of the character being analyzed and the program's best guess at what it is. The user can correct or confirm the program's guess at this point. Each guess is stored in the type table being built (or added to the one previously loaded into memory). One very useful feature that occurs during the learning process is the highlighting of the character within the overall document at the same time as the Guess window is active. This helps the user make sure the input character is correct; the differences among smaller characters such as commas and colons may not be obvious from the smaller Guess window. This one feature shows an attention to the user interface that I found superb. It would have been easy to just put up the Guess window alone, but the combination of the two windows makes using the program much simpler. This attention to detail greatly increases the overall usability of the program.

The learning process continues until you reach the end of the selected area. The Guess window then disappears, leaving the Picture window open with the selection area still highlighted. A click of the mouse in any other area will un-highlight the text.

The alternative method of teaching the program a new font is the RECOGNIZE AND LEARN command. This is usually used when an approximate font to the document has already been created. The type table is first loaded. Invoking this mode then sets the program to attempt to recognize the image. If the errors between the type table and the recognized character are greater than a user-definable threshold, the program then enters the Learn mode with the same Guess window and highlighting performed. After the user types the correct character, the program re-enters the recognition mode. This see-sawing continues to the end of the image with the characters recognized displayed in the text window, and the changes to the type table stored (although the type table changes are not written to disk without express user consent in a dialog).

This recognition mode is considerably faster than straight Learn mode, since the program doesn't stop at and query each character. Unfortunately, if the threshold is set too high, errors can creep into the output. This might routinely occur on graphically similar characters such as i and 1. However, if the value is left at the default value of 6, reasonable accuracy ensues.

At 200 dpi the mismatches will occur more frequently than at 300 dpi, since 300 dpi offers more informa-



The Options menu lets you choose whether kerned characters are being used — useful for typeset documents. Choosing ACCEPT LIGATURES tells *Read-it!* to recognize ligatures, where two letters touch each other, as separate characters.

If the file is too large to fit in the Mac's available memory, an error message will appear. Since a 300 dpi scan of a full page of text can run a megabyte or more, this may happen more frequently than you'd expect.

MacCalc

Speed, Style, Simplicity

Speed

MacCalc is the fastest spreadsheet you can buy, and More Speed gives you Greater Productivity.

"Amazingly speedy...[MacCalc] runs faster than Excel." — ***InfoWorld,*** *November 3, 1986*

"Special routines in MacCalc make operations such as entering data and recalculating, opening files, scrolling...faster than Excel." — ***Macworld,*** *December, 1986*

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MacCalc is easier to use and learn than any other spreadsheet, and Greater Ease means Less Frustration... "Simplicity is the ultimate sophistication."

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"Designed to be easy to use, and succeeds admirably." — ***MACazine,*** *March, 1987*

"MacCalc answers the frustration of Excel users – its carefully planned menu structure makes MacCalc exceptionally easy to use." — ***MacWEEK,*** *June 15, 1987*

"Simplicity and ease of use are MacCalc's greatest assets...[seen in] the richness and ease of use embodied in its user interface." — ***MACazine,*** *November, 1987*

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MacCalc is the only spreadsheet which allows each cell to have its own format, font, size, and style – allowing high-impact, desktop publishing quality output, and Greater Clarity creates Dramatic Presentations.

"MacCalc offers [the most] flexibility in page and font setup, and has the most printing options." — ***Macworld,*** *December, 1986*

"MacCalc lets you dress up your spreadsheet..." — ***Publish!,*** *June, 1987*

"MacCalc's formatting features allow your spreadsheet to look more like pages from a finished report...brings the concept of publication-quality spreadsheets closer to reality." — ***InfoWorld,*** *June 22, 1987*

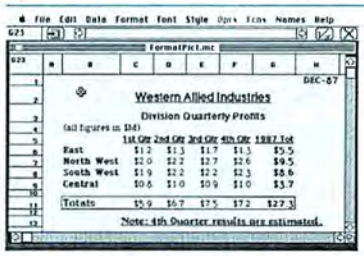
Value

At $139, MacCalc provides the greatest value at about 1/3 the price of Excel.

"The clear value leader." — ***InfoWorld,*** *November 3, 1986*

"MacCalc is a spreadsheet package of exceptional value." — ***MacWEEK,*** *June 15, 1987*

"The best deal in a spreadsheet package that I've ever come across, bar none." — ***MACazine,*** *November, 1987*



The Best Spreadsheet – MacUser Editor's Choice Award

"It's faster than either Multiplan or Excel, and once you move [to MacCalc] , you're not going to want to move back" — ***Macintosh Buyer's Guide,*** *Summer, 1987*

"...MacCalc is a must-have. The product itself is highly functional, easy to learn and to use, and definitely supports the most visually appealing formatting/printing capabilities." — ***MACazine,*** *November, 1987*

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Some of MacCalc's special features:

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- Full choice of format, font, size and style in each cell for DTP quality output
- Variable row height and column width
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- On-Line Help
- Full Undo command
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- Paste formatted tables from MacCalc directly into MacWrite or PageMaker documents
- Database sort, search, and fill commands
- Full desk accessory (DA) support and Switcher-compatibility

THE BOTTOM LINE: You can buy the slower, more difficult, overpriced, over-featured product from the competition, or you can buy MacCalc, the best spreadsheet for your real needs, for $139.

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For technical, corporate, or dealer information, please call 415/841-8552. MacCalc is available at better dealers everywhere. To order MacCalc directly for $139 (plus tax in CA), please call our order desk at 800/345-2888 (orders only, please), and have your VISA or MasterCard ready, or write: (Purchase orders cannot be processed.) Bravo Technologies, Inc., c/o DPAS P.O. Box T, Gilroy, CA 95021-2249. MacCalc® is a registered trademark and minimal recalculation™ is a trademark of Bravo Technologies, Inc. Other product names mentioned above may be trademarks of their respective manufacturers.

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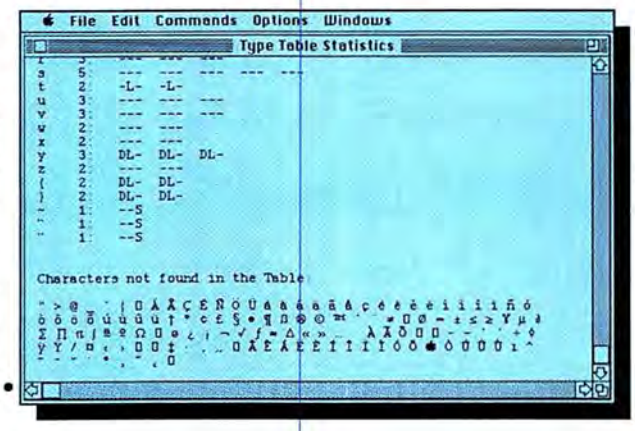
tion about each character. The output from a 200 dpi scan is "chunkier," and more likely to have stray pixels present in the scan. The most recurring error that I found at 200 dpi was the insertion of unneeded spaces between characters, but this is not a fatal error.

In general, 200 dpi images produced text that needed editing before it was usable. A desk accessory spelling checker like *Lookup* was valuable in this editing, calling my attention to words that I might have overlooked otherwise.

The RECOGNIZE command simply analyzes the image using the type table present in memory. You can watch the text window being created at about 10 characters per second for a Mac Plus and 40 characters per second for a Mac II or other 68020 equipped machine. At the end of the recognition process, *Read-it!* grades itself on how well it did by using the average errors it encountered per character.

This numerical value is an aid in determining the overall performance of a particular image/type table combination, but is not totally diagnostic of *Read-it!*'s performance. Any error that creeps into the output text has to be changed by human hands, decreasing productivity. And as with any OCR system, there will be errors. Minimizing them requires the use of the appropriate type table and the intelligent selection of the options available.

The Options menu can FILTER 1 PIXEL OUT, for instance. This allows the recognition algorithm to ignore 1 pixel deviations from what it expects in case there is some "dirt" in the scanned image. (While most useful at the 200 dpi scan level, this option can backfire and result in misrecognition at the 300 dpi level where more pixel information may be present.) If the font is monospaced (all elements of the font have an equal width), checking the MONOSPACED FONT option will aid in the recognition. Typewriter and daisywheel printer fonts are usually of this type. Another important option is KERNED FONTS. An example of kerning in a type would be the extension of a capital T over a smaller letter; the two letters share common horizontal space. LaserWriter fonts are usually kerned, for example. Thus, you would enable this option when using the Helvetica font table.



The SHOW TYPE TABLE STATISTICS brings up a list of the characters and their traits that the Table supports. It also shows what not to expect.

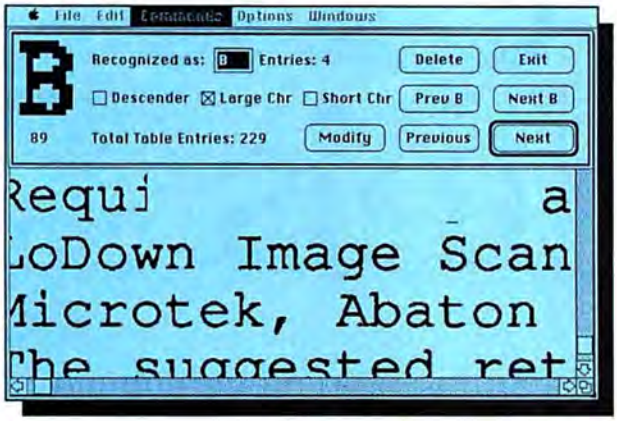


You must Load the type table of the font you are trying to read before attempting to Recognize characters. Type tables that come with *Read-it!* include those for popular typewriters (like Panasonic and Brother) and typeset fonts (like Helvetica and Times).

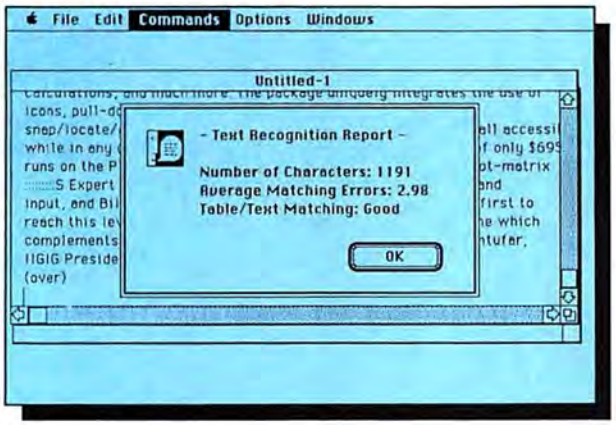
In general, 200 dpi images produced text that needed editing before it was usable. A desk accessory spelling checker like Lookup was valuable in this editing, calling my attention to words that I might have overlooked otherwise.

Ligatures are groups of two or three touching characters in a font. To handle these, *Read-it!* has a LIGATURE option. This option allows the keyboard entry of two or more characters in the type table for a single displayed character. Other options available include filtering out returns and dashes from the text. These may be useful if you wish to get only the "meat" of a document, and not the fancy formatting that may have been done. If the original formatting is important, there is a KEEP FORMAT option, that along with a CONTEXT SENSITIVE option, helps with some recognitions. Parameters involved in the recognition methods may be changed from a parameters dialog; but these are usually left alone except for the threshold value in the Recognize and Learn mode.

My experiences with version 1.02 of the program were almost entirely positive, once I gained experience with it. The 28-page manual supplied with this version of the program is woefully inadequate, however. It basically just describes the program and the typefaces supplied. No index is present. Olduvai ac-



The EDIT TYPE TABLE command brings up this dialog to let you further refine *Read-it!*'s recognition percentage.



At the end of the recognition process, *Read-it!* informs you how successful it was and grades itself on its performance.

knowledges this, and a major revision of the documentation should accompany version 1.1 of the program which should be available when this article hits print. Version 1.1 is supposed to be *MultiFinder* friendly, as well. Version 1.02 is *MultiFinder* hostile. Fortunately, the basic design of the program is clean and intuitive enough to overcome its serious documentation flaw.

Support from the non-toll-free number is adequate, although the staff available to support callers is limited. You may have to wait on hold for support personnel to become available. Once contacted, they seemed knowledgeable.

The program performs what it sets out to do, and that fact may be enough for its intended audience. If you do a lot of retyping, *Read-it!* can save you time, money and frustration, and it can dramatically increase your productivity. Productivity means enhancing resources by using existing or low-cost tools — like Rumplestiltskin turning straw into gold. *Read-it!* turns scanned images into text output — a feat less difficult, perhaps, but equally rewarding.

LARRY LOEB IS A CONNECTICUT DENTIST AND PROGRAMMER, NOT NECESSARILY IN THAT ORDER.

MACUSER RATING

Read-it! ★★★½

Follows Mac Interface	■ ■ ■ ■ ■
Printed Documentation	■ ■ □ □ □
On-Screen Help	None
Performance	■ ■ ■ ■ ■
Support	■ ■ ■ ■ □
Consumer Value	■ ■ ■ ■ ■

Comments: Optical character recognition software that works with any scanner that saves images as TIFF, PICT or bit map files. **Best Feature:** Ability to learn hard-to-recognize characters, even typeset letters that have been kerned. **Worst Feature:** Abysmal documentation; *MultiFinder* hostile. **List Price:** v 1.02, $295; version 1.1, $395. Published by Olduvai, 7520 Red Road, Suite A., South Miami, FL 33143. (305) 665-4665. Requires 1 M and two disk drives. Version 1.02 reviewed. Not copy protected.

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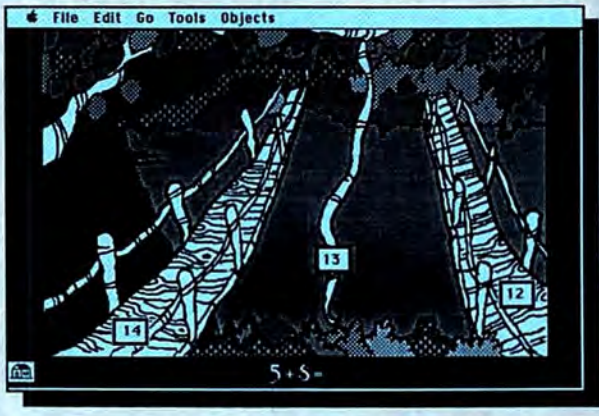
EDITED BY LAURA JOHNSON AND VICTORIA JUAREZ

Has anybody figured out what *HyperCard* is yet? An application? System software? A universal data standard that lets you store text, data, graphics, sound and even logical structures in a common format that can be shared by diverse applications? An intuitive programming tool that does to programming languages what calculators did to log tables? A dessert topping?

We're pretty sure it's not that last item, but whatever it is, the stacks keep stacking up. It's still too soon to subject stackware to our grueling reviewing process. So while the stackware authors get their bearings, we'll be giving you a glimpse of what *HyperCard* can do in Flash Cards. We've collected some of our favorites in the following pages. (You can find the shareware and freeware stacks on bulletin boards and the commercial stacks at your local software emporium.)

Some of these stacks are neat products; others are neat ideas. We hope they inspire you to create your own *HyperCard* stacks. And we hope you'll send a copy of your stack to Flash Cards, c/o *MacUser,* Suite 250, 110 Marsh Drive, Foster City, CA 94404.

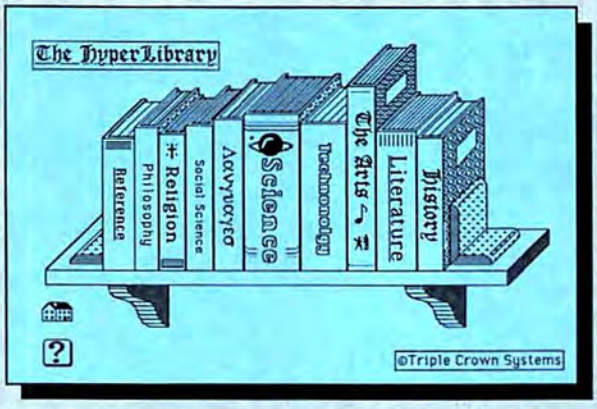
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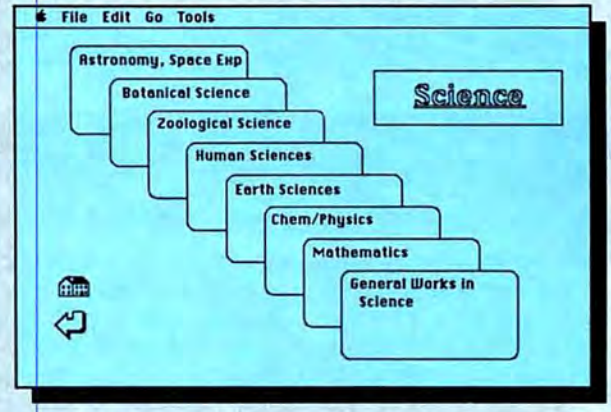




Your child moves through the jungle with this addition stack of 5's — forward for correct answers, backwards for incorrect ones. Animation and sound make learning math facts more fun (watching the elephant dance). Other stacks in addition, subtraction, multiplication and division are coming. *Jungle Adventure* from Marc Harrison, 14706 'O' Circle, Omaha, NE 68137.

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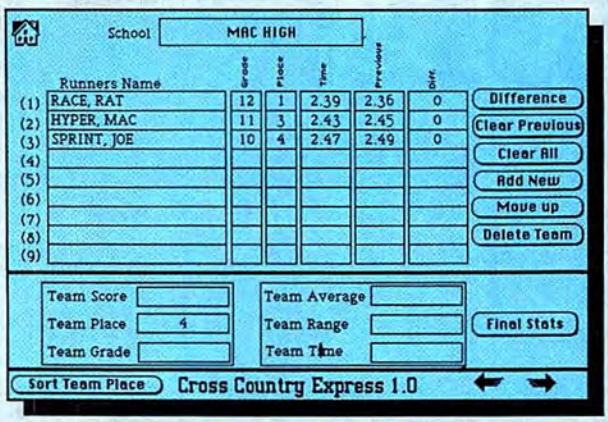
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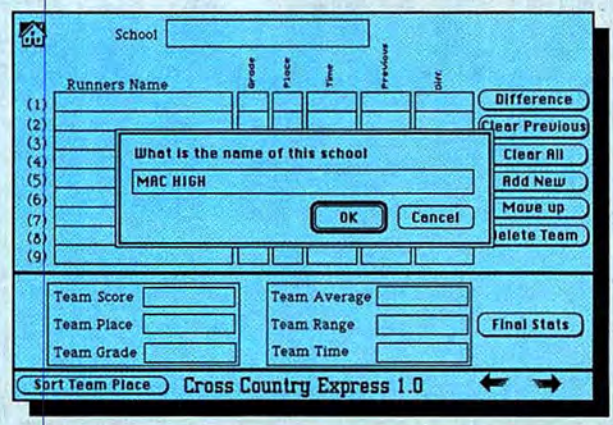
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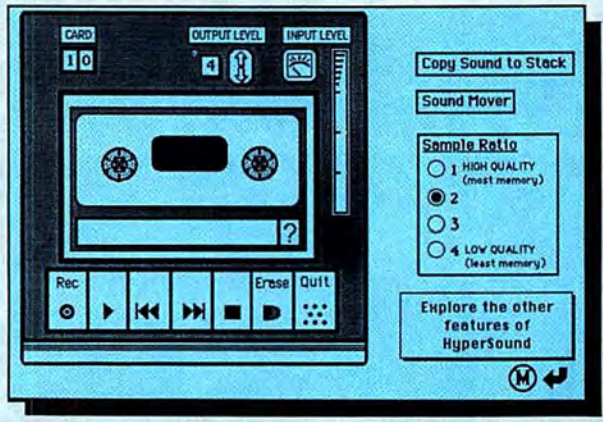
Road Runners

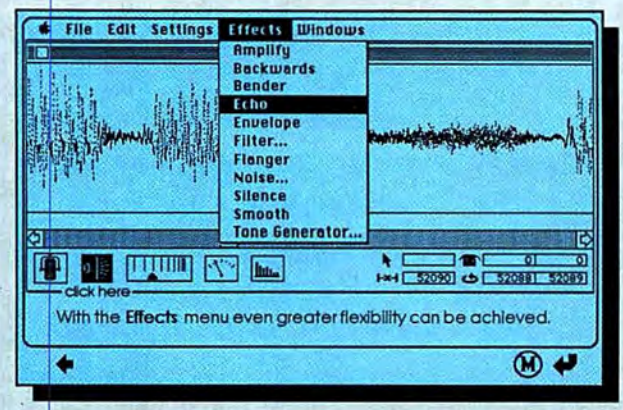




A *Hypercard* stack for your cross country team's running statistics. This one keeps team averages, range and times, and sorts team place. *Cross Country Express* by Lee Bass, GEnie: LBASS.

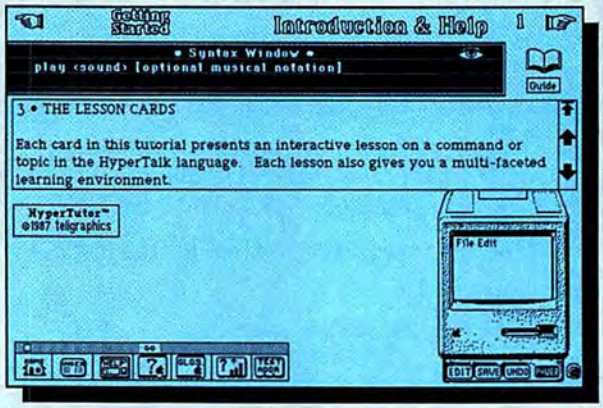
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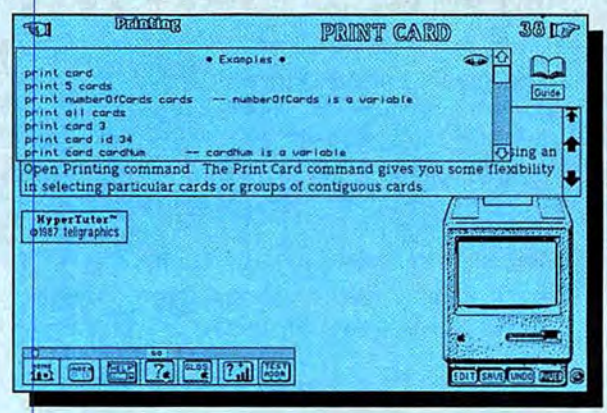




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Teacher, Teacher





Put power in your stacks with this *HyperCard* tutorial. It's made to be used by anyone from beginners to experienced programmers. *HyperTutor* teaches one concept at a time and includes practice exercises. *HyperTutor* from Teligraphics Creative Stackware, 936 Sir Francis Drake Blvd., Suite R, Kentfield, CA 94904.

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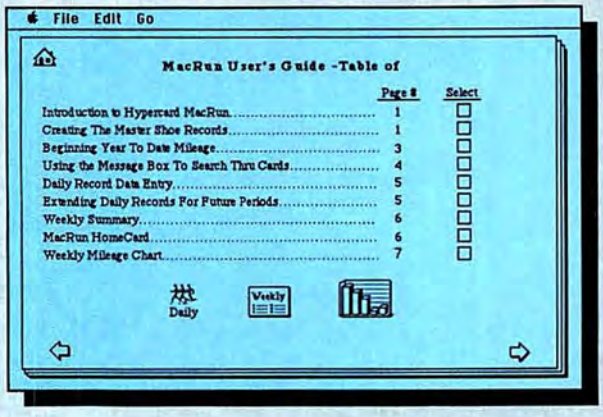
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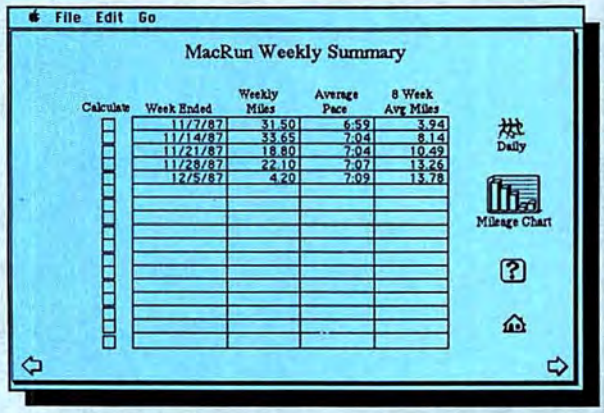
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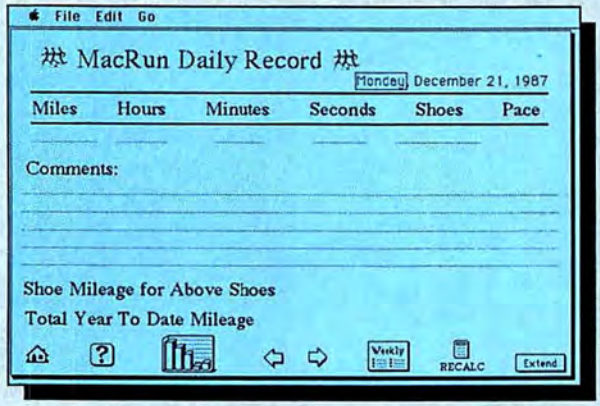
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Runner

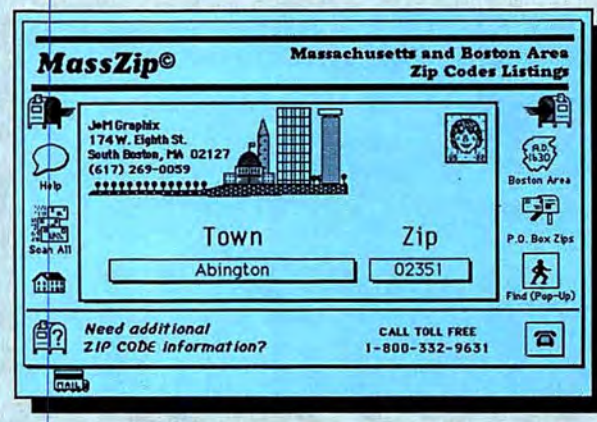


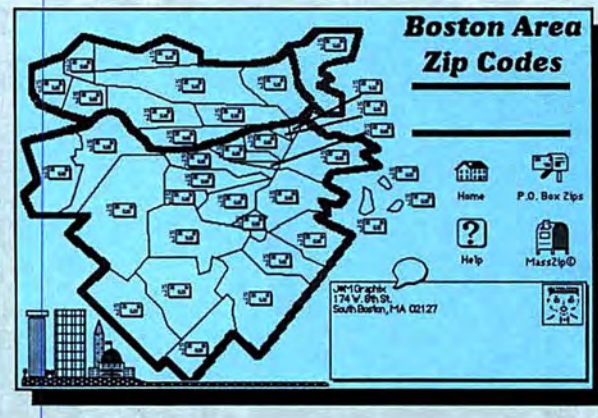


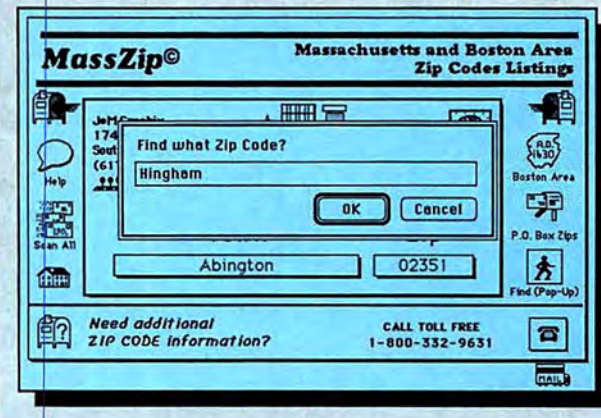


Want to keep track of the mileage on your running shoes? Then this stack is for you. Chart and calculate your running distance and time, daily or weekly, on this stackware designed for the serious and not-so-serious runner. *MacRun* from Run Soft Products, 15930 NE Siskiyou, Portland, OR 97230.

Mass Mailing







Zip along with *MacZip* — but only in Massachusetts. This Zip code stack has listings for over 400 cities and towns; a good idea for other states. From Jim McKee and J. M. Graphix, 174 W. 8th Street, So. Boston, MA 02127.



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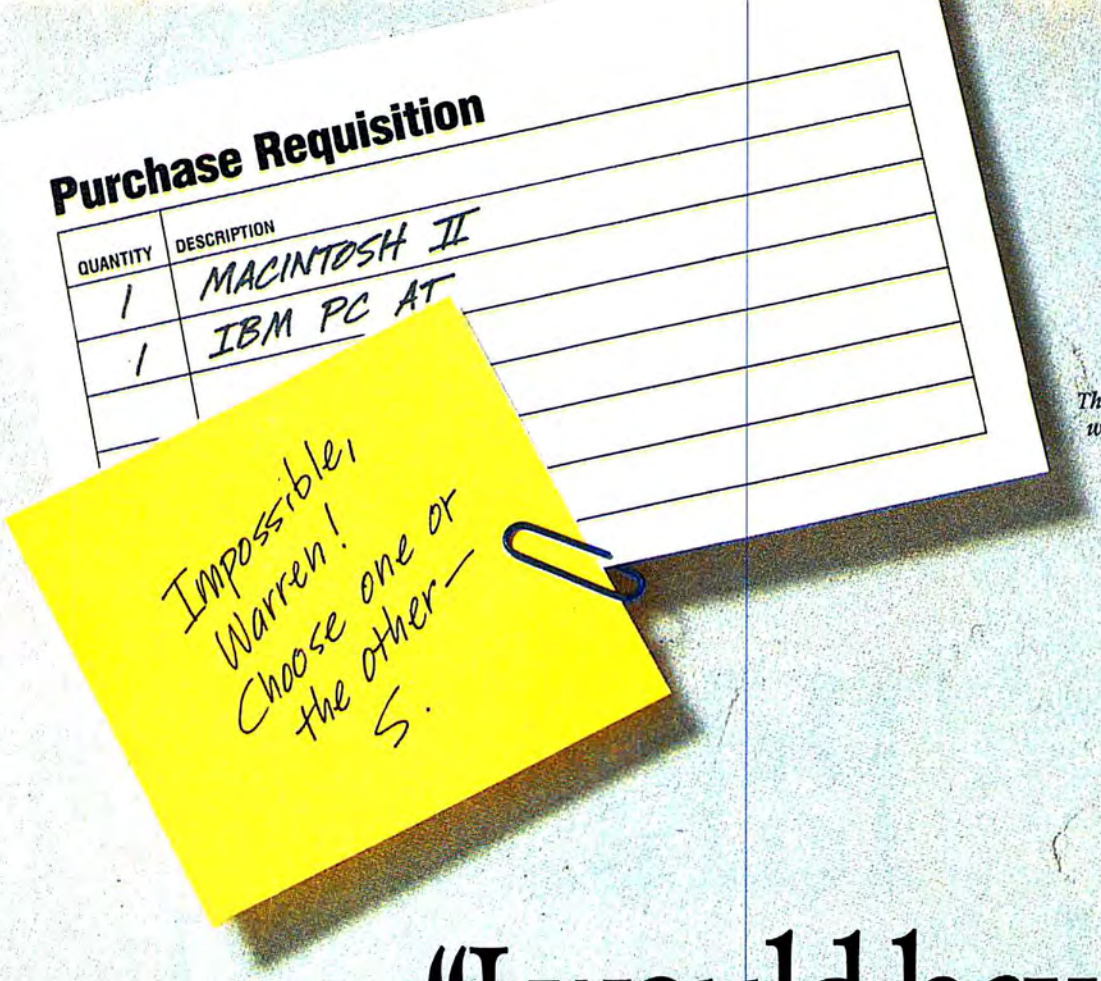
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The obvious solution was unrealistic.

"I would have given up anything to use a Macintosh, except my PC software."

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"You can't have your Macintosh™ and PC too." Famous last words.

People say, "Where there's a will, there's Warren." Which means I don't settle for words like No. Impossible. Can't be done. No way.

So when I decided I wanted a Macintosh, but didn't want to give up Lotus 1-2-3® or dBASE® III, I naturally set about looking for a way to have it all.

The fastest fix was to buy both an IBM® PC and a Macintosh. "Not possible," said the DP/MIS manager. "Pick one. Any one you want, as long as it's MS-DOS® compatible." Witty guy.

Then I searched everywhere for someone willing to loan me a PC in exchange for executive privileges. I was willing to give up anything, but I kept hearing No. Not interested.

Without another alternative in sight, I decided to surrender and settle for a PC. Then, I discovered an article on AST's newest products—

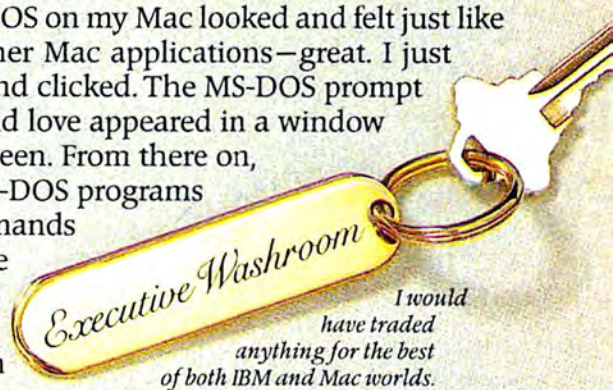
What I like best about AST's Mac86 and Mac286:

- *I retain the benefits of the Mac desktop while running DOS*
- *I can cut and paste text from both MS-DOS and Macintosh environments*
- *I have full access to DOS programs and data through 5.25" MS-DOS floppy drives*
- *My MS-DOS files share Macintosh hard disk volumes*

MS-DOS co-processors for the Macintosh II and Macintosh SE. The cavalry had arrived.

The article said AST's Mac86™ and Mac286™ allow you to actually run MS-DOS application programs on your Macintosh. Just plug the DOS processor into your Macintosh II—Mac86 into an SE—and load your favorite MS-DOS application software onto the Mac's hard disk. I was sold.

MS-DOS on my Mac looked and felt just like all my other Mac applications—great. I just pointed and clicked. The MS-DOS prompt I know and love appeared in a window on my screen. From there on, I used MS-DOS programs and commands as if I were working on a PC.



I would have traded anything for the best of both IBM and Mac worlds.

I even moved Macintosh files into MS-DOS, sometimes cutting and pasting parts from one environment to the other. And when I was finished with my PC and Macintosh files, I stored them both on the same Macintosh hard disk without any clumsy file transfer procedures to slow me down.

Back in the Macintosh environment, I still had immediate access to all of my PC files. Using Macintosh software, I reopened a PC file, enhanced it, then merged it with a Mac file. And when I was finished, I printed it on the LaserWriter®.

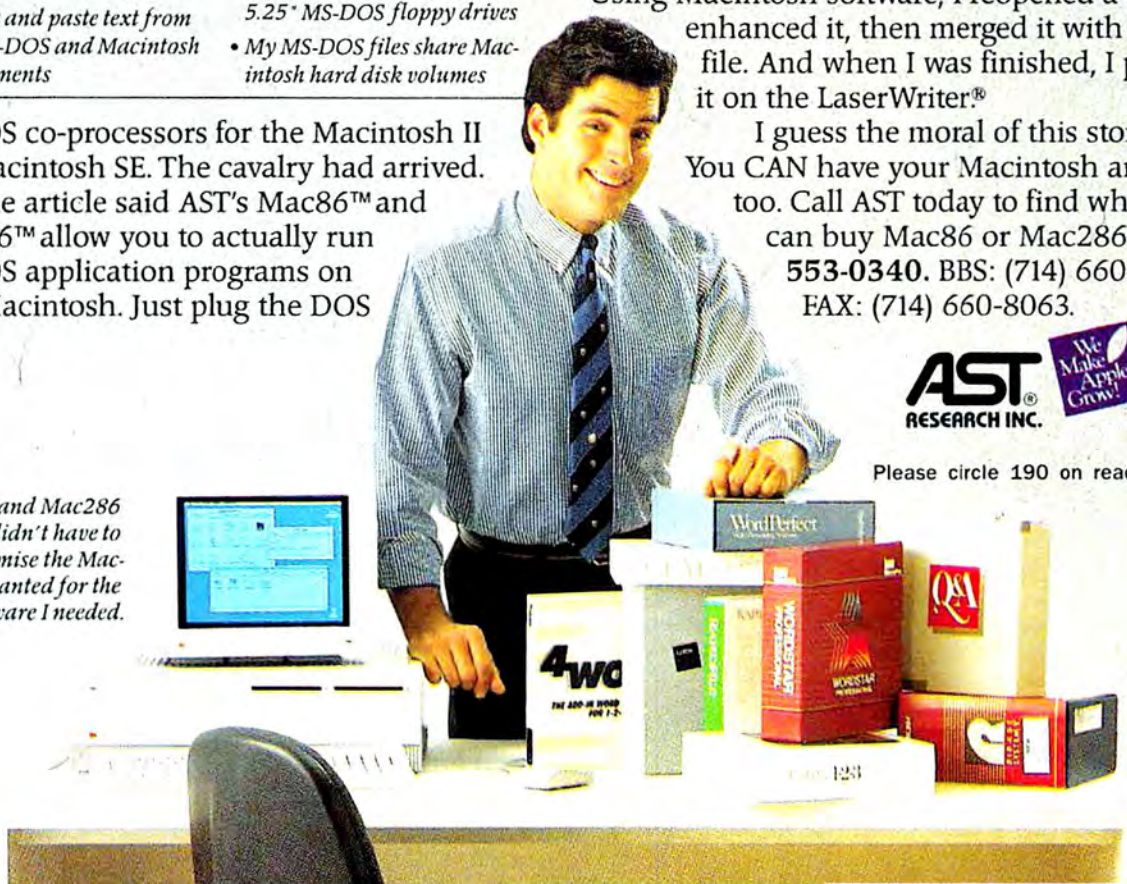
I guess the moral of this story is: You CAN have your Macintosh and PC too. Call AST today to find where you can buy Mac86 or Mac286. **(714) 553-0340.** BBS: (714) 660-9175. FAX: (714) 660-8063.

AST® RESEARCH INC.

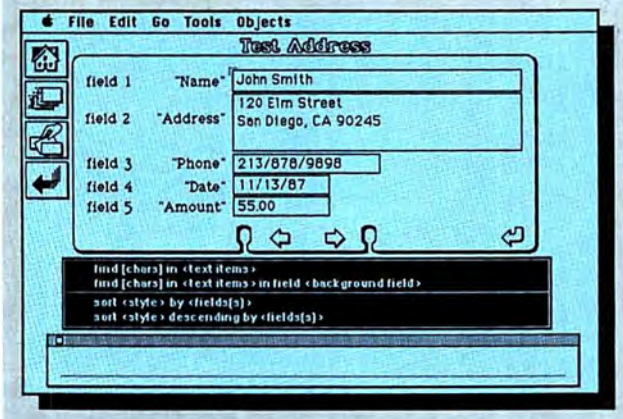
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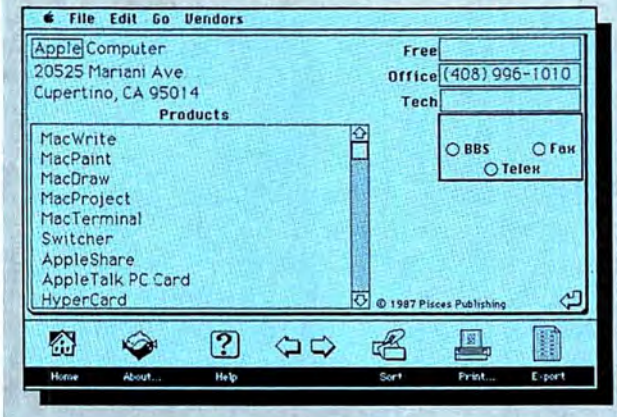
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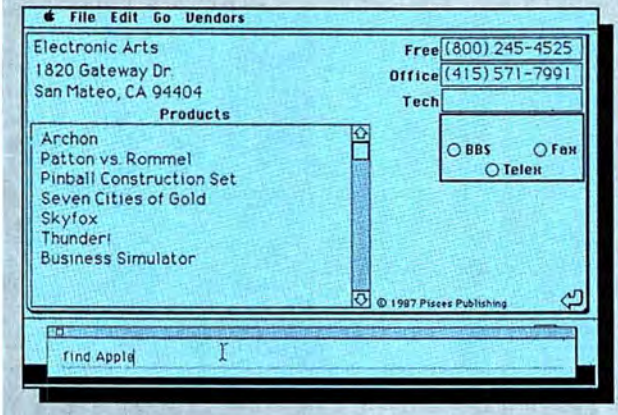
Mac86 and Mac286 meant I didn't have to compromise the Macintosh I wanted for the IBM software I needed.



Reruns







MacVendors' first quarter '88 update (see January "Flash Cards") lists over 300 hardware and software vendors. Search or sort by vendor, category, zip code — see what works. This latest version allows you to add, delete or change entries. From Pisces Publishing, 616 Rancheria, Suite C, Chico, CA 95926.

. . . And More Reruns







HyperNews (which first appeared in February "Flash Cards") is deserving of another appearance on these pages. This monthly newsletter features the latest happenings in the *HyperCard* world. It has reviews of stackware, interviews, feature articles, tips and the "inside scoop" on the stackware industry. Available on CompuServe, GEnie, major bulletin board services, *HyperNews* is a free service of Training Resources Unlimited, 31849 Pacific Highway South, Suite 115L, Federal Way, WA 98003; CompuServe: 70441,2663; GEnie: HyperNews.

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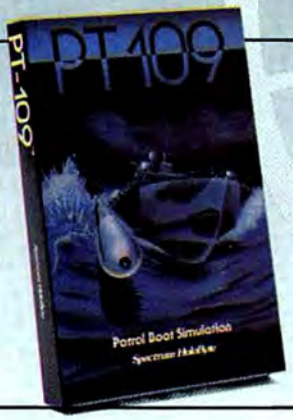
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Macintosh Version

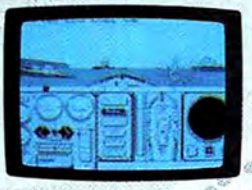
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Macintosh Version

Available on Macintosh 512K (Macintosh Plus compatible) and IBM 256K

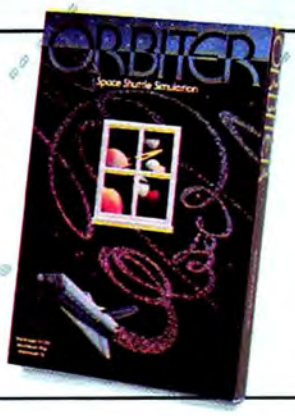
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IBM Version

Available on Macintosh 512K (Macintosh Plus compatible), IBM 256K, and soon available on Atari ST



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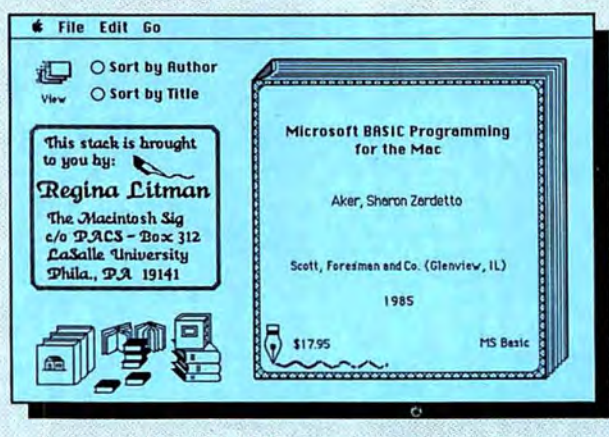
Christmas '88

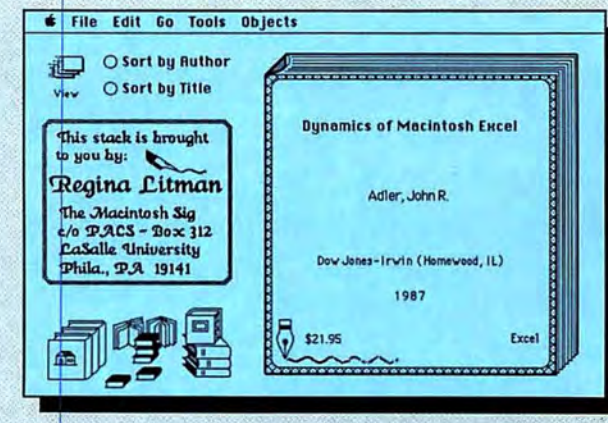




While you're still paying for last Christmas, browse through the *Mac-Easy Christmas Shoppe* stack for unusual gift ideas for those hard to please people on your list. Freeware by Starlight Express, Atlanta, GA.

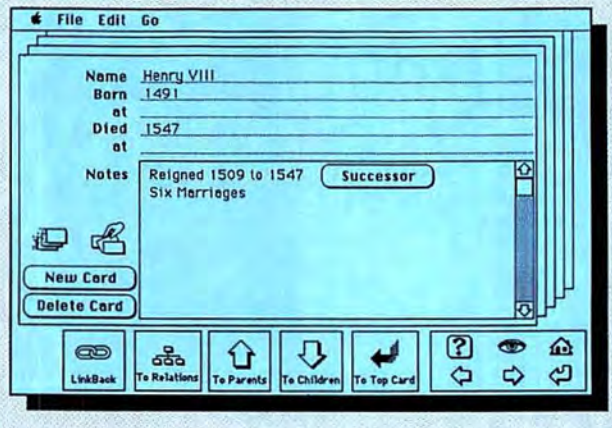
Bibliomania

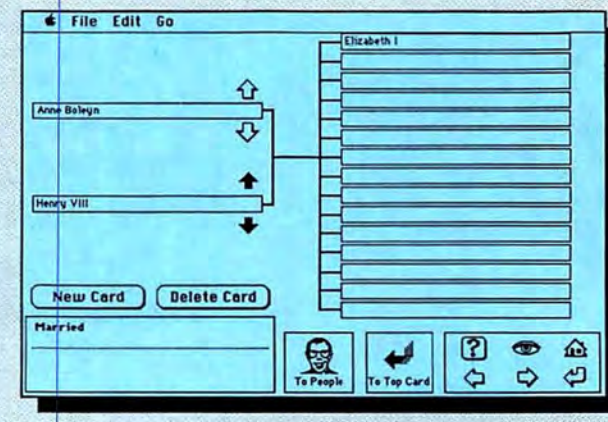




An extensive listing of Macintosh literature, with suggested retail prices included. Sorts by author or title. By Regina Litman, The Macintosh Sig, c/o PACS, Box 312, LaSalle University, Philadelphia, PA 19141.

I'm Henry the VIII, I Am





Learn a little history while you explore the capabilities of this genealogy data base. *Genealogy Explorer* by Joel Finkle, Food for Thought Software, 9235 Fern Lane, Des Plaines, IL 60016.

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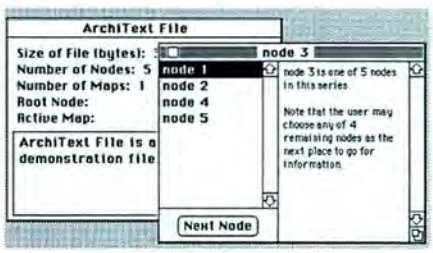
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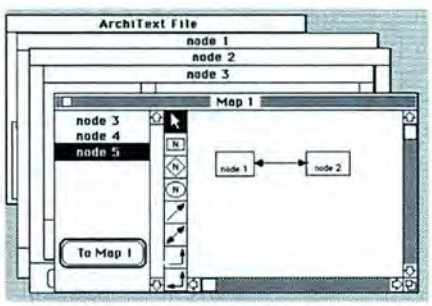
ArchiText captures text from a variety of sources. Then, following the user's specifications:

- searches for words, word combin-ations or Boolean combinations and places the captured text into an informational unit, or "node;"



Files consist of maps and nodes. A file information window and node are pictured.

- pastes in Paint, Draw or PICT graphics from other applications;
- links individual nodes in a variety of different ways;



Information map being created. Notice 3 available nodes on left; 2 nodes in map; and selection of linking tools.

- finds new relationships among existing nodes.



Peter Pan, Call Home!

In 1904, J.M. Barie wrote a charming play introducing us to the boy who never wanted to grow up. Some eight decades later Peter Pan and his progeny are alive and well. In fact, his family is well represented in the computer industry—an unfortunate development for many of this industry's customers.

Pete and his sons exhibit three attributes which make them a blight on the fruit of the hardware and software products we have come to depend on: irresponsibility, immaturity, and an irritating narcissism.

Each member of the Pan clan demonstrates a total recalcitrance in accepting responsibility for his actions; every product failure, every unkept promise, every unmet expectation is always attributed to bad luck, the other guy, poor management, and a host of other lame excuses. The result is that, more often than not, Peter produces work product that doesn't.

Typically, when Peter finally releases his product, it is long overdue. This is because Peter and his playmates have a real problem with time (after all, never wanting to grow up is certainly a time linked phenomenon). Pete is unable to make any reasonable estimates of time to end-of-job, unable to discipline himself to get there, constitutionally incompetent to do the job, doesn't care, or all of the above.

The frosting on this situational cake is that Pete has an ego of towering proportions. The tipoff to this is when Pete tells you he is an "artist," and that his output (or lack thereof) is the result of his "creativity." Rigorous written design documents, performance contracts, and all the other management tools used to increase productivity belong in someone else's world—certainly not the one he inhabits.

In a world where computers are needed to help us build safe space shuttles, manage strategic weapons, and pursue a cure for cancer, we can no longer afford Pete and the costs he imposes. So, we all should be telling him to pack up his attributes, and his fairy dust, and to return, once and for all, to Never Never Land.

Sherwin Steffin, President, BrainPower, Inc.

ArchiText's flexibility in capturing and manipulating textual information is just the beginning of it's power and versatility. The user can individually tailor and present the information to *any number* of viewers and can completely control the viewer's:

- *access* to nodes ;
- *path taken* when moving from one node to the next;
- ability to modify nodes;
- *time spent* within each node;
- ability to *copy and print* information contained within any node.

Additionally, the user can *record and playback* all viewer choices:

- each node visited;
- the order of node selection;
- the time spent in each node:
- any keyboard entries the viewer adds within a node.

ArchiText will be available in early July, and carry a list price of $349.95. However, *special pre-release discounts are available starting March 1.* Call us and ask for the free **ArchiText** brochure and special pre-release savings!

ArchiText requires a Mac with at least 512K of RAM and the 128K ROMS.

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MathView Professional: mathematical problem solver. $249.95

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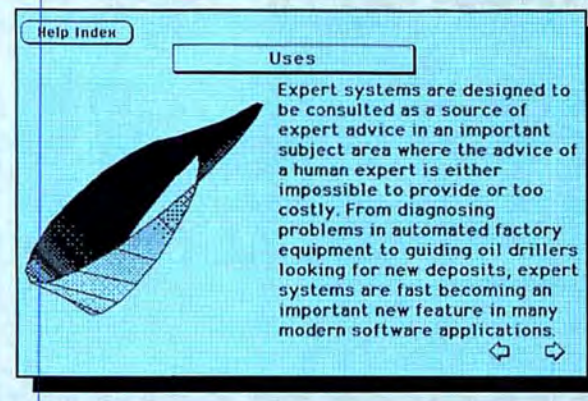
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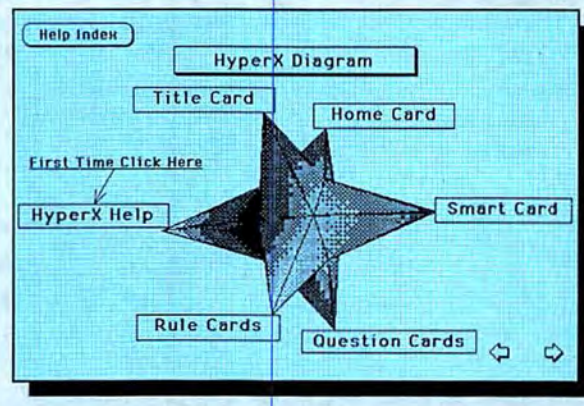
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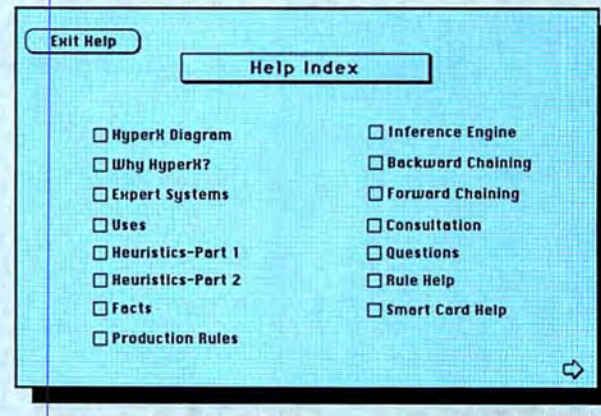
C A R D S

Intelligent Mac



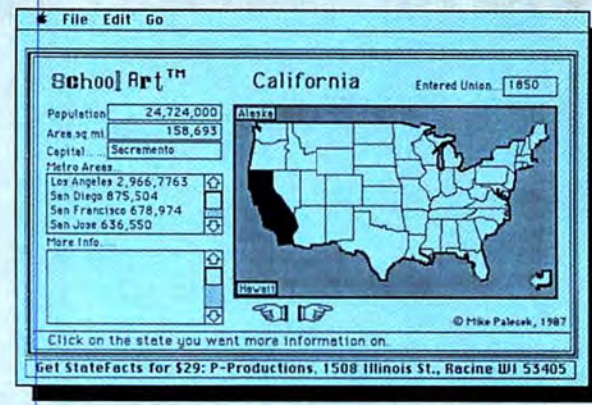


A glimpse into the world of artificial intelligence. This is an educational stack which provides visual examples of some of the concepts used in expert systems. *HyperX* from Ron Evans, Millennium Software, 1970 S. Coast Hwy., Laguna Beach, CA 92651;



State your Facts

States Facts is a state geography data base. Click on a state to get information such as date of admission, population, capital and top five cities. From P-Productions, 1508 Illinois St., Racine, WI 53405.



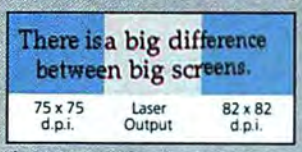
Would you buy a big screen with your eyes closed?

In 1986, there was one dual-page display for the Macintosh™ computer: our MegaScreen.™ The choice was simple. Now, it seems, everybody and his dog makes one. To make matters worse, there are very few places you can go to compare displays.

But you don't have to buy "blind." Our MegaScreen gives you advantages we can easily demonstrate here.

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Claims of "high resolution" may sound good, but with all the different screen sizes, the only easy way to compare resolution is in dots per inch (d.p.i.). Other big screens give you a compressed display, showing 82 or even 94 dots per inch. That means 10-point type looks like 7-point type. It's just too small to edit or even read comfortably. Our 75 x 75 d.p.i. display gives you accurate sizes and shapes.



If you want your big screen to show accurately what will be printed, you need our 75 x 75 d.p.i. resolution.

We offer one- and two-page MegaScreens for the Macintosh SE and Macintosh II. Interface cards are dealer-installed — typically in less than 10 minutes — without voiding the Apple® warranty. MegaScreens are also available for the Macintosh Plus.

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With an SE, we know you're giving up your slot by adding an interface card, so we've provided options. You can choose a card with a 68881 math co-processor, or you can select our modular card, which provides its own 'slot' for our MegaModules, such as a video output (NTSC, PAL, and standard Macintosh signal).

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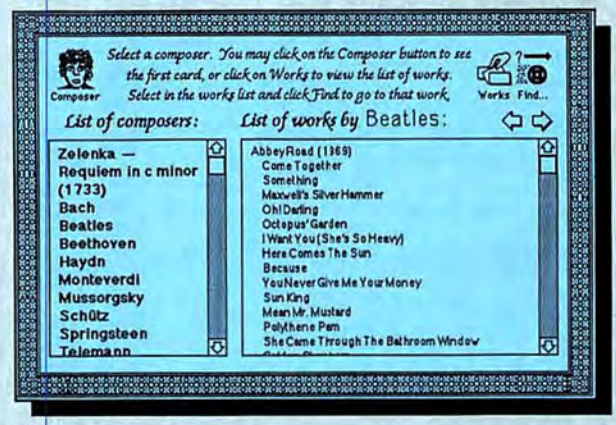
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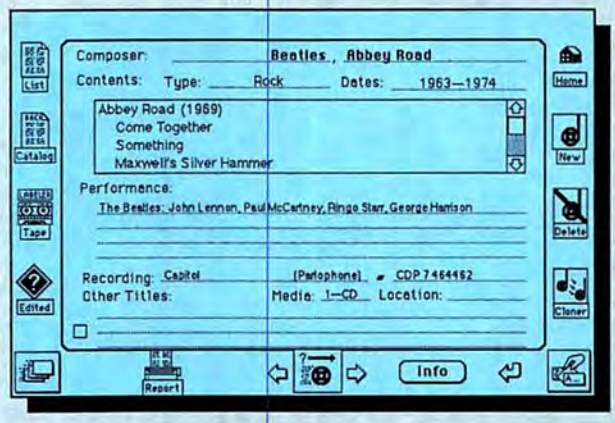
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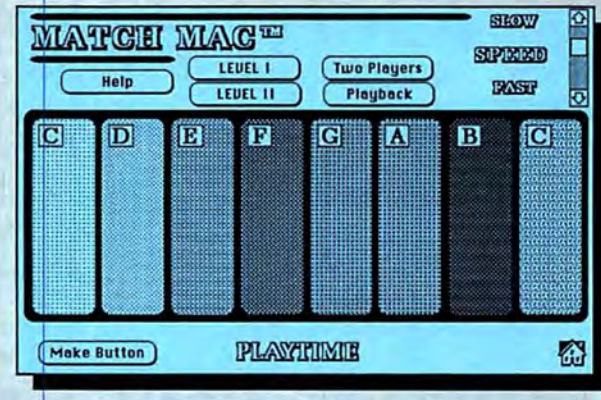
Round of Music

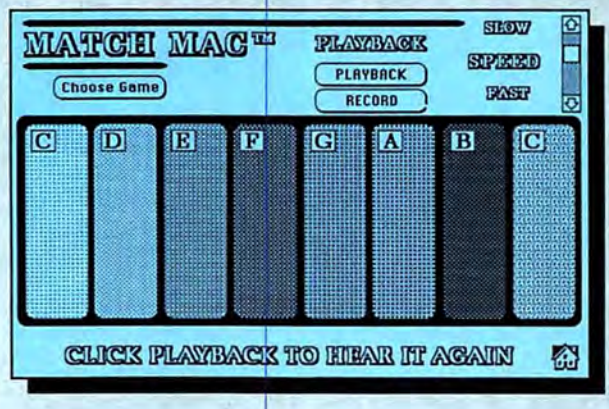




Index your sound recordings, and print catalog cards and tape labels with this stack. It lists composers and their various works and has search capabilities. *Music Cards* is shareware from Ross Frank, 3047 Fulton Street, Berkeley, CA 94705.

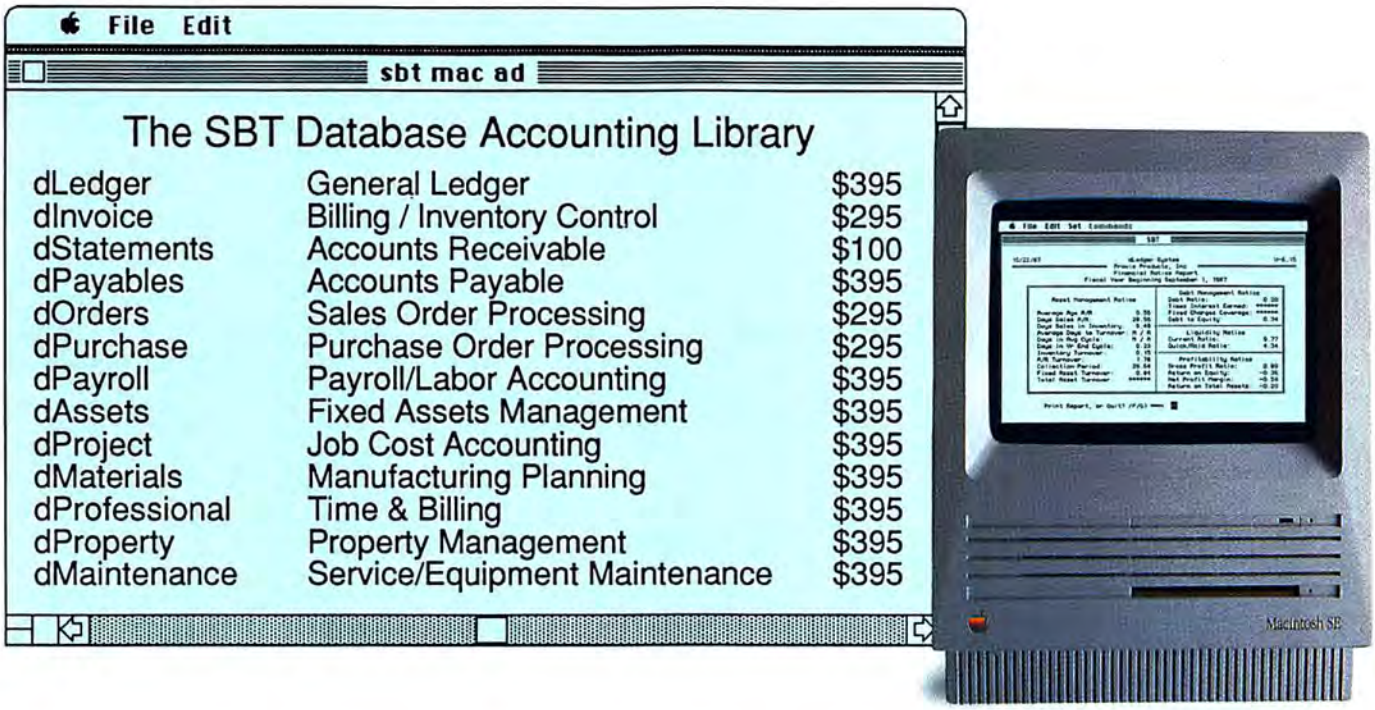
Match and Rematch





This stack recalls hand-held games of the 70's. The computer plays notes, then you click on the same notes. Level and speed are changeable; you can play the computer, another player or have the computer duplicate your clicks. *Match Mac* is shareware from Eldon Benz, RR2 Box 318, Carbondale, IL 62901.

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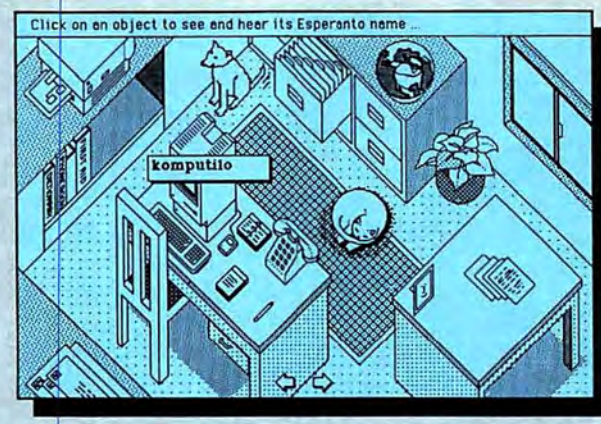
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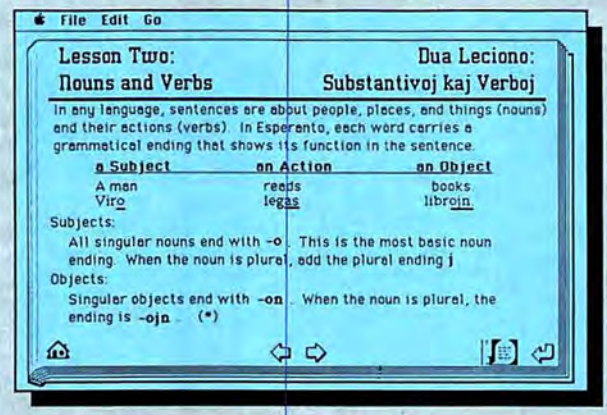
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F L A S H C A R D S

Li Skribas Per Komputilo





Or translated, "He writes with a computer." This stack is a beginner's course in the international artificial language, Esperanto. Learn the language so you can attend the Universala Kongreso. *Esperanto Course* from Michael Urban, PO Box 24560, Los Angeles, CA 90024.

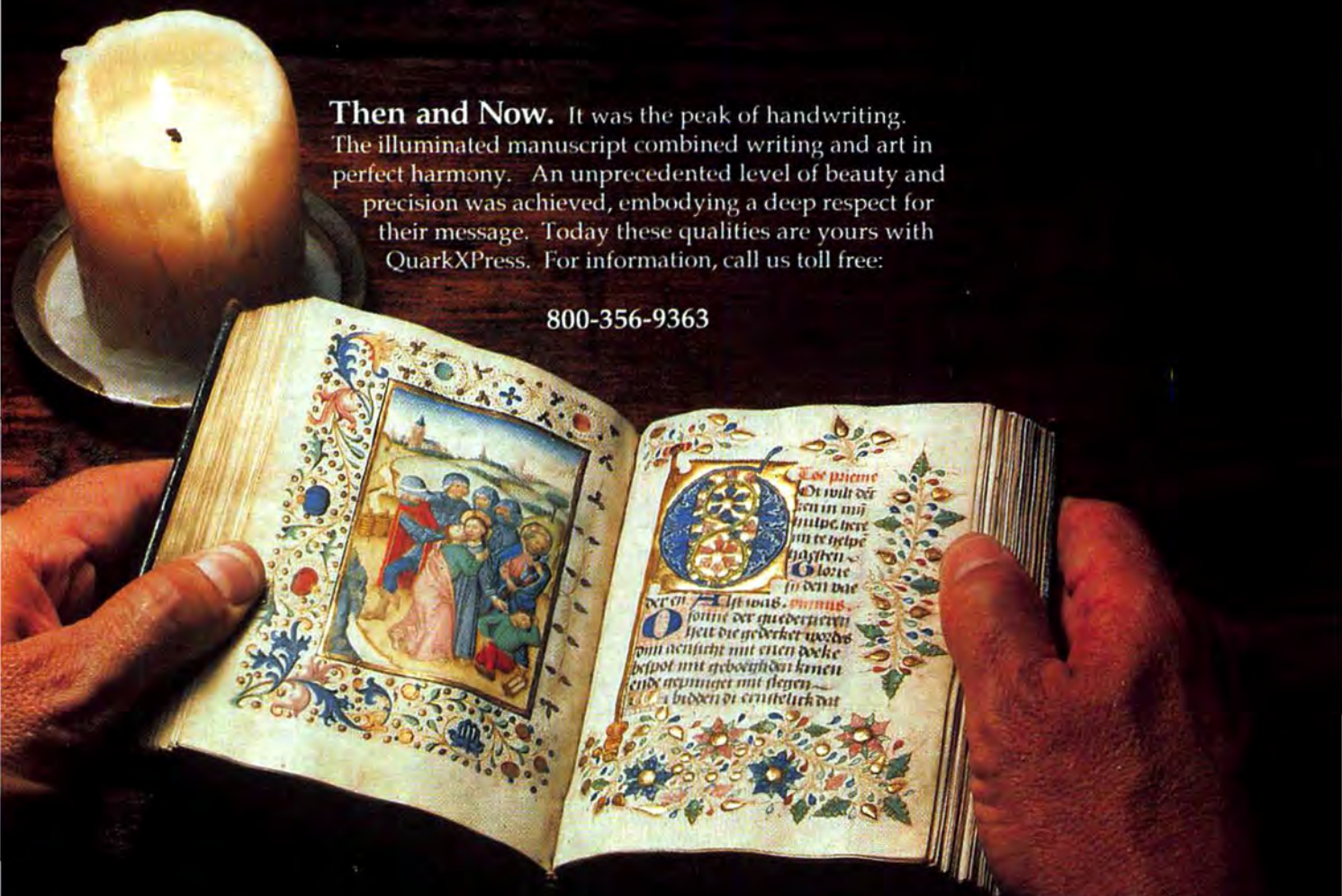


Credit To the Mac

Don't wait until your credit card disappears to discover this stack. List all your cards, account numbers, expiration dates and other pertinent information. *Credit Base* is freeware from Johnny Middleton, M/D-K1, 3501 Ed Bluestein Blvd., Austin, TX 78721.



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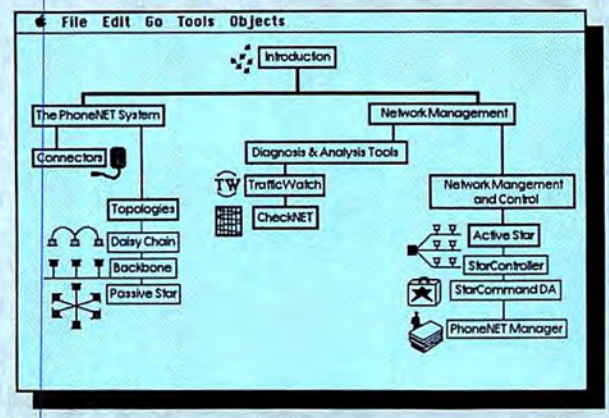
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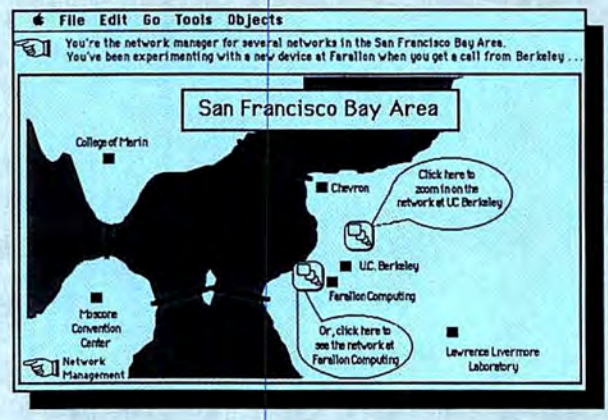
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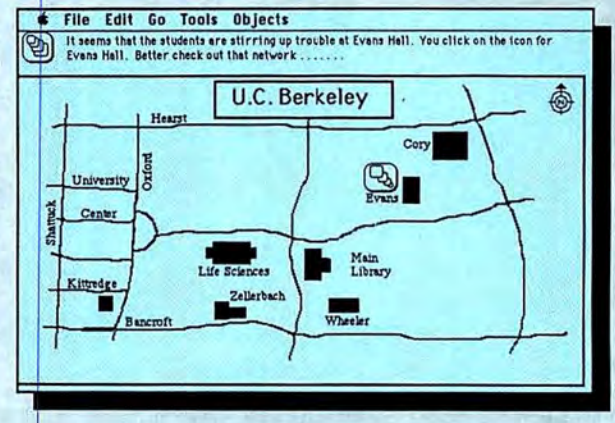
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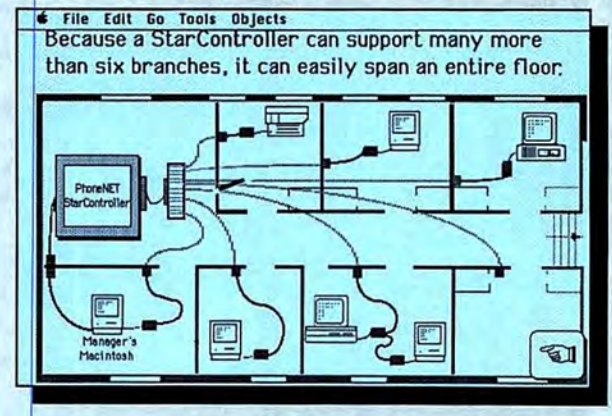
PhoneNET Goes HyperCard





This network cabling and management system is now available for use with *HyperCard*. *PhoneNET* uses existing telephone lines for reliable and cost effective local networks. Network management tools cover troubleshooting, traffic management/optimizing and network management. *PhoneNET* from Farallon Computing, 2150 Kittredge St., Berkeley, CA 94704.





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Robert Forras, MacTimes

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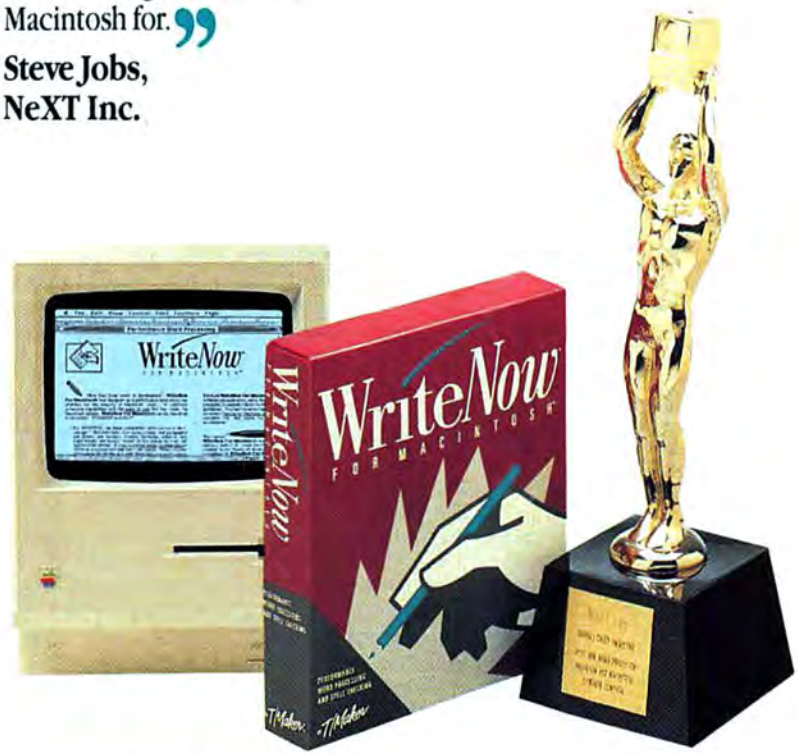
John Dvorak, San Francisco Examiner

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Michael Miller, InfoWorld

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Best New Word Processor
MacUser Magazine 1986

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Dan Farber, MacWorld Magazine

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Vicky Jo Varner, The MACazine

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MINIFINDERS



Have you often wished for a personal assistant to help in picking software? These MiniFinders may not breathe and move, but they do tell you what products are hot and, better, what these products do. Each of these items has been carefully reviewed and selected by the *MacUser* editorial staff. Each has been rated in increments of half mice, from 1 to 5. Ratings are relative within categories, and they can change as categories expand and new products advance the state of the art. You won't see many low ratings or bombs, since we're telling you about the cream of the crop, but we will warn you about the really bad products so that you don't spend your money on them. Blue names indicate this month's additions. The letters at the end of the entries indicate whether a product is copy protected (CP) or not (NCP). If a product has been reviewed or Quick Clicked in *MacUser*, the date of the review is shown. Next time you have to find products you can count on, count on *MacUser*!

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INTEGRATED SOFTWARE

Crunch is an icon-driven relational spreadsheet that features versa-
★★★★ tile charting and data base capabilities. Strong financial logic, date and mathematical functions. Spreadsheets can be linked. The manual is clear and concisely written. Macros are not supported. $195. VisiCorp, 2700 Augustine Dr., Santa Clara, CA 95054. CP (Jan 86)

Excel is THE power spreadsheet. Of the Mac, of the world. Has 256-
★★★★★ column by 16,384-row capability. Features include a powerful macro function (with a recorder to make creation simple) and elaborate charting facilities. 512K+ Mac and external drive required. $395. Microsoft, 16011 NE 36th Way, Redmond, WA 98073-9717. NCP (Prem)

Jazz provides well-integrated modules for word processing, graphs,
★★★★ worksheets, data bases and communications. HotView is best feature. Requires 512K+ and external drive. Version 1A requires 400K drive. $395. Lotus, 55 Cambridge Parkway, Cambridge, MA 02142. CP (Prem)

Microsoft Works is an integrated application that includes word
★★★★½ processing, data base, spreadsheet and telecommunications functions. The telecommunications module includes background up- and downloading. $295. Microsoft, 16011 NE 36th Way, Redmond, WA 98073-9717. NCP (Oct 86)

Trapeze (version 2.0) is a powerful presentation worksheet that
★★★★½ combines mathematical functions and graphic representation. The interface, which consists of an icon bar, can be awkward to use. Mac II and color supported. $395. Access Technology, 555C Heritage Harbor, Monterey, CA 93940. NCP (Dec 87)

BUSINESS ACCOUNTING

Accountant, Inc. V2.0 integrates accounts payable, accounts re-
★★★ ceivable, general ledger and inventory modules. Prints checks, purchase orders, invoices, customized reports. Bare bones accounting system limited in size and scope, but ease of use and integration make it suitable for small businesses. Requires 512K+. $299. SoftSync, 162 Madison Ave., New York, NY 10016. NCP (Oct 87)

Back to Basics Accounting is a powerful double-entry accounting
★★★★ software package for the small business user with GL, AR and AP modules. Exhaustive manual with numerous examples. Report capabilities are excellent. $199. Peachtree, 4355 Shackleford Rd., Norcross, GA 30093. NCP (May 87)

BPI General Accounting is an easy-to-use system. Six journals,
★★★★ AR, AP, Payroll and GL on one disk. Offset amounts automatically post to ledgers. Up to 8000 accounts. Detailed records, wide range of reports. *Switcher* and HFS compatible. $249. Requires 512K+. BPI Systems, 3001 Bee Cave Rd., Austin, TX 78746. NCP (Aug 86)

CheckMark is a Ledger with five preset journals: Cash Disburse-
★★★★ ments, Receipts, General, Sales and Purchases. Menus and data entry are very straightforward. Flexible summary reports are built in; customer and vendor info is very minimal. $295. CheckMark Software, PO Box 860, Fort Collins, CO 80522. CP (Dec 85)

Insight is a high-powered accounting program for the small-to-medi-
★★★★½ um-sized business. At present, three modules are available: Accounts Receivable, Payables and General Ledger; others are in the works. Requires 512K and hard disk. $595. Layered, 529 Main St., Boston, MA 02129. NCP (Dec 86)

Rags to Riches integrated accounting modules (General Ledger
★★★★½ and Accounts Receivable) uses Mac interface to the hilt. Information entered in one window automatically transfers. Version 3.0 now provides detailed, flexible report options. Very easy to use, but it can be confusing with several windows on screen. Requires 512K+ and printer. $199.95 per module. Chang Labs, 5300 Stevens Creek Blvd., San Jose, CA 95129. NCP (Dec 85)

Rags to Riches Professional Billing tracks and bills professional
★★★★ services. Batches activities for individual timekeepers. Use as standalone, or integrate with *R to R* modules. Requires 512K+, printer. $399.95. Chang Labs, 5300 Stevens Creek Blvd., San Jose, CA 95129. NCP (Feb 87)

Strictly Business General Ledger features clear, well-outlined set
★★★★ up procedures and operations. Very flexible, up to 99 profit centers with up to 100 departments each; and customized reports. Program print spools. Requires 512K+, printer and external drive. $395. Future Design, 13681 Williamette Dr., Westminster, CA 92683. NCP (Dec 85)

PERSONAL FINANCE

Dollars & Sense is a bookkeeping program. Easy to use, with a
★★★ good manual and excellent on-screen help. Will handle up to 120 separate accounts or money categories. Uses standard double-entry accounting techniques. Will work on 128K. $149.95. Monogram, 8295 S. La Cienega Blvd., Inglewood, CA 90301. CP (Mar 87)



MacInTax is an excellent tool for preparing tax forms. Intuitive, easy
★★★★★ to use. Accepts data from leading personal finance programs. Good built-in help. Liberal upgrade policy for current owners. California forms set also available. $99 federal; $45 California. SoftView, 4820 Adohr Lane, Suite F, Camarillo, CA 93010. NCP (Mar 87)

MacMoney is a complete and easy-to-use personal financial sys-
★★★★½ tem. Intuitive data entry. Integrates with *MacInTax*. Requires 512K+. $74.95. Survivor Software, 11222 La Cienega Blvd., Inglewood, CA 90304. NCP (May 87)

Market Pro is a comprehensive portfolio management program for
★★★★ the generation of fundamental data as well as technical charts and graphs. Requires 512K+, external drive and Hayes-compatible modem. $395. Pro Plus Software, 2830 E. Brown Rd., Mesa, AZ 85203. NCP (Nov 86)

DATA BASES

Business Filevision is a masterpiece of Macintosh programming,
★★★★ the only true graphic data base on any micro. Much more powerful than the original, accepts *MacPaint* graphics. $395. Telos Software, 3420 Ocean Park Blvd., Santa Monica, CA 90405. NCP (Feb 86)

C.A.T. is a dedicated relational data base for managing contacts,
★★★½ activities and time. Difficult to learn, but easy to use. Its rigid structure takes some getting used to, but links between types of data make it easy to keep track of important people and events. $299.95. Chang Laboratories, 5300 Stevens Creek Blvd., San Jose, CA 95129. NCP (Nov 87)

dBase Mac is a relational DBMS that includes a structured pro-
★★★★ gramming language to develop standalone applications. Palette icons as alternatives to menu commands will help novice users. Requires 1M+. $495. Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502-1319. NCP (Feb 88)

Double Helix II is a powerful data base that supports a multiuser
★★★★½ environment with an upgrade. Uses an icon-based development system for easy creation of data bases. $595, single user version. Odesta, 4084 Commercial Blvd., Northbrook, Ill 60062. NCP (Apr 88)

File is a flexible data manager. Creates files for a variety of data,
★★★★ including simple graphics. Files are created in simple row/column format, but reports and forms are easily customized. $195. Microsoft, 16011 NE 36th Way, Redmond, WA 98073-9717. CP

FileMaker Plus retains features of *FileMaker* and reads *FileMaker*
★★★★★ data, also displays up to 8 files, uses "lookup" to retrieve data from other files. Enhanced calculation with many additional functions. Scripts automate a sequence of actions. Requires 512K+. $295. Nashoba Systems, 175 Sudbury Rd., Concord, MA 01742. NCP (Nov 86)

4th Dimension is a powerful relational data base that creates
★★★★½ standalone applications. Features a Pascal-like programming language environment. Somewhat slow. $695. Acius, 20300 Stevens Creek Blvd., Cupertino, CA 95014. NCP (Nov 87)

MacDewey! (version 2.5) is a cataloging program featuring the
★★★ Dewey Decimal Classification system. Uses predefined fill-in-the-blank fields to create catalog cards. Suffers from bugs in search routines and the inability to distinguish first names. Not for professionals; home libraries might benefit. $79.95. Mousetrap Software, 336 Coleman Dr., Monroeville, PA 15146. NCP (Nov 87)

MacRelax is a relational list manager that stores data in a column
★★ format. Files can be related by sharing a common field. Flexible design for reports. Screen display is sometimes strange. Easy to use but not obvious to learn. $59.95. 1M+ required. Arrays, 6711 Valjean Ave., Van Nuys, CA 91406. NCP (Jan 87)

Omnis 3 is a power data base, featuring concurrent multiple file
★★★★ management. Can handle 24 files, 12 at a time, and is fully relational. Create custom environments including user-defined menus, commands and dialogs. $495. Blyth, 2929 Campus Dr., San Mateo, CA 94403. NCP (Mar 86)

OverVUE is a power-packed relational data base that has extensive
★★★★½ sorting, summarizing and report generation capacity. Has macros and a charting function. Good manual. It can exchange files with a very wide variety of other programs (including IBM software). $295. ProVUE, 222 22nd St., Huntington Beach, CA 92648. NCP (Nov 85)

Professional Bibliographic System is a specialized data base for
★★★★ storing and retrieving bibliographies. Redesigned templates (20) simplify creation. Version 2.6 offers improved speed, flexible formatting. $295. Personal Bibliographic Software, Box 4250, Ann Arbor, MI 48106. CP (Feb 87)

Record Holder is a flexible, easy-to-use form-oriented data manag-
★★★★ er. Setup is particularly simple and the search features are powerful. $69.95. Software Discoveries, 137 Krawski Dr., South Windsor, CT 06074. NCP (Apr 86)

Reflex For The Mac is a flexible relational data base. Excellent
★★★★½ report generator gives full control over appearance, style of output. Requires 512K+, second drive or hard disk. $99.95. Borland International, 4585 Scotts Valley Dr., Scotts Valley, CA 95066. NCP (Dec 86)

Reflex Plus is a relational data base with "smart" entry and report
★★★★ design, but no overall programming facility. Simple to set up, yet fast. Graphic capabilities are quite limited. Version 1.0 reviewed. $279. Borland/Analytica, 4585 Scotts Valley Dr., Scotts Valley, CA 95066-9987. NCP (Feb 88)

Writer's Workshop maintains orderly records for writers. It can
★★★½ track manuscripts, income and publisher. Based on and includes *Runtime Helix*. $99.95. Futuresoft System Designs, PO Box 132, New York, NY 10012. NCP (Apr 87)

NUMBER CRUNCHING

DesignScope is a construction kit for digital and analog circuits. Up
★★★★ to 254 components can be utilized in a single circuit, and the equivalent of a dual trace oscilloscope plots output in real-time. Good for testing circuitry without touching a breadboard. $249.95. BrainPower, 24009 Ventura Blvd., Calabasas, CA 91302. NCP (Nov 86)

MacCalc is a fast, competent, full-featured spreadsheet with im-
★★★★ pressive built-in functions, font control, on-line help, ability to expand columns and rows and read/write SYLK or WKS files. The worksheet is 125 columns by 999 rows. Cell names, printing power make *MacCalc* a very flexible pure spreadsheet. $139. Bravo Technologies, c/o DPAS, PO Box T, Gilroy, CA 95021. NCP (Sep 86)

MacSpin is a unique and powerful graphic data analysis program.
★★★★ Handles multivariate data in a highly visual manner. Nothing else like it for any micro. $199.95. D² Software, PO Box 9546, Austin, TX 78766-9546. CP (Jun 86)

Mindsight is a professional level decision support and business
★★★★ planning package. Can work with IFPS on mainframes, and is able to transmit models in both directions. Powerful and easy to use. Requires 512K+. $249. Execucom Systems, PO Box 9758, Austin, TX 78766. CP (Dec 86)

Multiplan, the first Mac product from someone other than Apple, is
★★★½ beginning to show age. Still a very capable basic spreadsheet with simple sorting, 63 columns by 255 rows, many built-in functions, other standard spreadsheet features. $195. Microsoft, 16011 NE 36th Way, Redmond, WA 98073-9717. CP (Mar 86)

Parameter Manager is a data manager, incorporating integrated
★★★★ scheduling, statistics and graphics. It has solid spreadsheet, calendar and data base functions, and reports can be

customized using other software. *Parameter Manager* can also import data from *Excel* or *Lotus 1-2-3*. $495. SMS, 651 River Oaks Parkway, San Jose, CA 95134. NCP (Jul 87)

StatView 512+ is a very intuitive statistical analysis program with ★★★★★ tools needed to understand any set of data. Holds data in a spreadsheet-like form. Full-featured, fast and accurate. Extremely wide range of analyses possible. Requires 512K+ and 800K of disk space to operate. $349.95. BrainPower, 24009 Ventura Blvd., Calabasas, CA 91302. NCP (Dec 86)

GRAPHICS & DESIGN

CalendarMaker creates monthly calendars in a variety of formats. ★★★★½ Users can incorporate their art and daily notes. Note files can be imported from a variety of DA calendars and outliners. Shareware and prelicensed versions available. $49.95 CE Software, 801-73rd St., Des Moines, IA 50312. NCP (Dec 86)

Canvas is a Draw and Paint program that uses QuickDraw as its ★★★★½ output language. Full of features, including free rotation and one and two point perspective. Also has graphics macro commands, unusual in a program this inexpensive. $195. Deneba, 7855 N.W. 12th St., Suite 202, Miami, FL 33126. NCP (Jan 88)

Chart can easily create area, bar, column, line, pie, scatter and ★★★½ combination charts. A total of 42 styles are provided. Limited to 100 data items (64 in a series) on a 128K Mac, approximately twice that on a 512K Mac. $125. Microsoft, 16011 NE 36th Way, Redmond, WA 98073-9717. CP

ClickArt Special Effects is a *MacPaint* enhancement desk accessory. ★★★½ Allows the user to distort, stretch, rotate and use perspective on *MacPaint* documents. A necessary addition for all serious users of *MacPaint*. $49.95. T/Maker, 1973 Landings Dr., Mountain View, CA 94043. NCP (Apr 86)

ColorPrint allows you to print *FullPaint*, *MacPaint*, *MacDraw* and ★★★ *MacDraft* documents in color using the ImageWriter II or ImageWriter I. *Paint* files set up as overlays are read into *ColorPrint*, and the program controls proper positioning registration. $29.95. I/O Design, PO Box 156, Exton, PA 19241. NCP (Mar 86)

Comic Strip Factory is an assembly program for creating comic ★★★★½ strips. Includes a data base of parts for various characters and backgrounds for panels. Good text editing in balloons. Can import and export in *MacPaint* format. $89.95. Foundation Publishing, 10301 Yellow Circle Dr., Minneapolis, MN 55343. NCP (Dec 87)

Cricket Draw is an object-oriented drawing program that will pro- ★★★★★ duce stunning, high-quality output. Designed to print on PostScript-compatible devices, such as the LaserWriter. Making shadows and flowing fountain effects is just a point and click away. $295. Cricket Software, 30 Valley Stream Pkwy., Malvern, PA 19355. NCP (May 87)

Cricket Graph easily generates 12 graph types. Multiple windows ★★★★★ can be displayed. *Graph* prints in up to 8 colors with up to 16 patterns. Self-generating macro formatting. *Switcher*, HFS, LaserWriter and plotter compatible. $195. Cricket Software, 30 Valley Stream Pkwy., Malvern, PA 19355. NCP (Jun 86)

Crystal Paint creates an electronic kaleidoscope. It is *MacPaint*'s ★★★★½ Brush Mirrors gone wild in a small, simple, yet wonderful application. Does not work in color on Mac II. *MultiFinder* friendly. Requires 512K+. $49.95. Great Wave Software, 5353 Scotts Valley Dr., Scotts Valley, CA 95066. NCP (Feb 88)

DeskPaint is a full-blown paint program as a desk accessory. Allows ★★★½ you to spruce up a graphic while in another application. Imports and exports *MacPaint* and TIFF images. Great for DTP, but not enough features to rival the leaders in paint programs. Zedcor, 4500 E. Speedway, Tucson, AZ 85712-5305. NCP (Mar 88)

"Draw it again, Sam..." (v. 1.03) is an object-oriented graphics ★★★★ program, like *MacDraw*, that adds such useful wrinkles as layered drawing, on-screen libraries and color. Manual is weak. Requires 512K+ and an 800K disk drive. $150. Aba Software, PO Box 850, Frazer, PA 19355. NCP (Feb 88)

Easy3D is a three-dimensional, solid modeling masterpiece. Four ★★★★ variable light sources, powerful sculpting tools and an exquisite user interface make this a must-have for graphics enthusiasts. Requires 512K+. $149. Enabling Technologies, 600 S. Dearborn, Chicago, IL 60605. NCP (May 86)

EZ Draft is a high-level CAD application. Does things usually only ★★★ found on minicomputer programs. Uses "pop-up" menus to supplement a full set of pull-down menus. Comes with an additional set of printer/plotter/monitor drivers. A real powerhouse. $1995. $500 for IEGS module to link to other CAD programs. Bridgeport Machines, 500 Lindley St., Bridgeport, CT 06606. CP (May 87)

FastForms! Construction Kit is both a fast and efficient business ★★★★★ forms creator (a drawing program) and a specialized application (and DA) to fill out the data fields in your forms. $149 (US). Shana Enterprises, 9704 54th Ave., Suite 200, Edmonton, Alberta T6E 0A9, Canada. NCP (Nov 87)

Fluent Fonts is a two-disk collection of fonts. Forty-nine different ★★★★ items are included. All install easily in user systems. Most are well executed and some are extraordinarily nice. This is a real bargain for font lovers. $49.95. CasadyWare, PO Box 223779, Carmel, CA 93922. NCP

Fontastic is the best font editor now available for the Mac. Features ★★★★½ a large editing window with a grid to make positioning easy. Select letters to edit by clicking on a matrix of the font. Allows scaling of existing fonts and previewing the various styles. $49.95. Altsys, PO Box 865410, Plano, TX 75086. NCP (Dec 85)

Fontographer is a complex, but excellent laser font creator. The ★★★★½ fonts created have 300 bits-per-inch resolution. The fonts are actually downloadable PostScript files. $395. Altsys, PO Box 865410, Plano, TX 75086. CP

FullPaint is an expanded version of *MacPaint*. Features include full- ★★★★★ screen drawing, multiple documents opening simultaneously, brush editing, movable tool palettes, special text effects and much more. It fills the gaps left by *MacPaint*. $99.95. Ann Arbor Softworks, 2393 Teller Rd., Newbury Park, CA 91320. NCP (Jun 86)

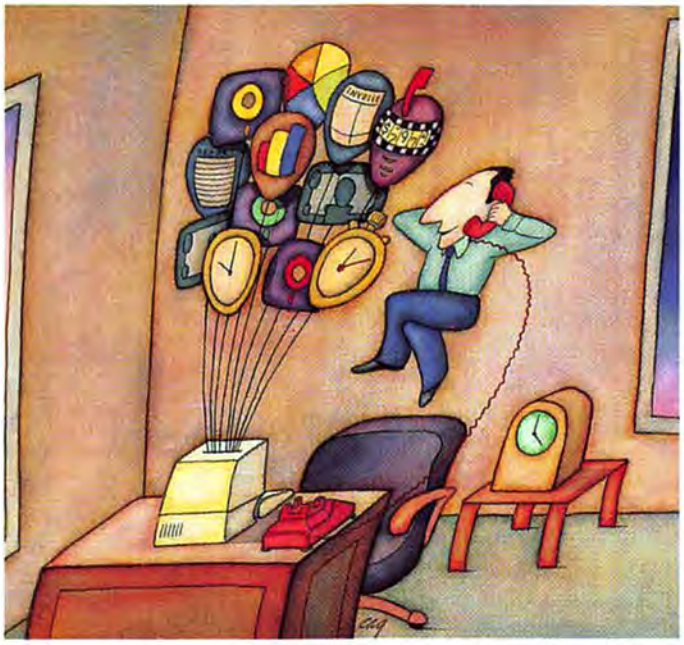
GraphicWorks 1.1 is a powerful drawing and painting program ★★★★ that creates high-resolution bit-maps. Easels contain graphics, balloons hold text and both reside on panels. Graphic primitives are now a separate tool. $149.95 Mindscape, 3444 Dundee Rd., Northbrook, IL 60062. NCP (Oct 87)

Graphidex indexes *MacPaint* and *MacDraw* format graphics without ★★½ removing them from their original documents. Indexed graphics are retrieved via the *Graphidex* DA. Can modify an indexed graphic without affecting the original. Best for bit-mapped (*Paint* format) images but the design is questionable and the execution imperfect. Requires 512K+. $124.95. BrainPower, 24009 Ventura Blvd., Calabasas, CA 91302. NCP (May 87)

GridMaker is a tool for artists who use perspective. The program ★★★ automatically generates a series of three-dimensional plane sets that can be pasted into *MacDraw*. Sizes and viewing vantage point are easily modified. $49. FolkStone Design, PO Box 86982, North Vancouver BC V7L 4P6, Canada. NCP (Nov 86)

Illustrator is a professional-level graphics program. Unique and ★★★★½ powerful drawing technique. Program uses templates for precise and detailed art work. Requires 1M+. $495. Adobe Systems, 1870 Embarcadero Rd., Palo Alto, CA 94303. CP until registered. (Jul 87)

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MINIFINDERS



Japanese Clip Art is a two-disk set of extraordinary Japanese clip ★★★★½ art. Consists of *MacPaint* documents and separate fonts. Volume I, Heaven, covers mythological subjects; Volume II, Earth, has secular subject matters. $79.95 each volume; $149.95 set. Qualitas Trading, 6907 Norfolk Rd., Berkeley, CA 94705. NCP (Apr 87)

LaserFonts are new fonts for the LaserWriter. Users download ★★★★ them to their machines. Very high quality and very simple to use. *Willamette* looks like Avant Garde. *MicroFonts* provides tiny, expanded and condensed versions of the LaserWriter's own fonts. $34.95 to $44.95 each. Century Software, 2483 Hearst, #175, Berkeley, CA 94709. NCP

LaserPaint needs a major fix and quick. Its clumsy interface makes ★ it a slow program. There's good laser output, if you persevere through the creation of a document. The support is scads better than the documentation, which is lousy. Version 1.1.4. $495. LaserWare, PO Box 668, San Rafael, CA 94915. CP (Jan 88)

The Mac Art Dept. is a collection of over 150 graphic images ★★★★ ranging from foods to hands holding signs to borders. Best suited for letterheads, memos, other business use. $39.95. Simon & Schuster, Computer Software Div., 1 Gulf + Western Plaza, New York, NY 10023. NCP (Mar 86)

Mac-a-Mug is an Identikit type program for creating faces from ★★★½ facial feature files. Uses scroll bars that are slow and jerky. Lots of creative fun. 1M+ Mac required. $59.95. Shaherazam, PO Box 26731, Milwaukee, WI 53226. CP (Jul 86)

MacCalligraphy is the best simulation of brush painting in any ★★★★½ graphics program. User-designed Seals and Touches enable you to design your own signature tool and the style of brush you use. Comes with a clip art disk. $175. Qualitas Trading, 6907 Norfolk Rd., Berkeley, CA 94705. NCP (Feb 88)

MacDraft is an object-oriented graphics program. It sports ad- ★★★★ vanced features such as variable scaling, single degree rotation, complex arcs and a FatBits-like magnification mode. Best used to complement *MacDraw*, not replace it. $239. Innovative Data Design, 2280 Bates Ave., Concord, CA 94520. NCP (Feb 86)

MacDraw is an object-oriented structured graphics program. Can ★★★★½ be used to design forms, create presentation materials and do technical illustrations. Drawing sizes up to 8 feet by 10 feet are possible. Text can be easily generated and integrated in the graphics. $195. Claris, 440 Clyde Ave., Mountain View, CA 94043. NCP (Nov 85)

MacModel is an economical 3D package with shading. Somewhat ★★★ sketchy Mac interface, shading speed slow (but acceptable), grainy image resolution. On-line help screens are a welcome addition. Frequent updates and low price make this a reasonably good buy. $40. A.P.P.L.E. CO-OP, 290 SW 43rd St., Renton, WA 98055. NCP (Aug 86)

MacPaint is the graphics program that started a whole new genre. ★★★★ Still the best freehand graphics tool. Version 1.5 supports 512K+ Macs and the LaserWriter. Multiple tools, patterns and features too numerous to describe. A work of art for artists. $125. Claris, 440 Clyde Ave., Mountain View, CA 94043. NCP

MacTEX (v. 2.0) is the TeX environment of choice for hardcore TeX ★★★½ users on the Macintosh. Very intimidating for others. Painfully slow and visually unattractive. Requires 1M+. $750. FTL Systems, 234 Eglington Ave. East, Toronto, Ontario M4P 1K5, Canada. NCP (Apr 88)

Mac3D 2.0 is a feature-laden 3D program with a *MacDraw*- ★★★★ like interface. PostScript-resolution shading with six variable light sources, user-definable tools, and many more features make this a powerhouse. $249. Challenger Software, 18350 Kedzie Ave., Homewood, IL 60430. NCP (Jan 87)

MapMaker produces maps and analyses of related geographical ★★★★½ data. Additional data disks available. Documentation could be better. Requires 512K+; 2nd drive recommended. $295. Select Micro Systems, 40 Triangle Ctr., Yorktown Heights, NY 10598. NCP (Jan 87)

MGMS: Professional CAD for Macintosh offers more than 200 ★★★★ functions. Very complete, capable program. Groups, Dimension, Libraries, etc. are standard. Sometimes confusing — designed for experienced, professional CAD user, not the novice. Full plotter support. 512K+ or Mac XL. $799. Micro CAD/CAM, 3230 Overland Ave., Los Angeles, CA 90034. NCP (Nov 87)

MiniCad V3.0 is a pro level CAD package. Vast array of features, ★★★★ many accessible only through Command/Shift/Option key combinations. Works in 2D or 3D with easy transition from one to the other. *MacDraw*-like interface makes it easy to learn and use. Requires 512K+. Diehl Graphsoft, 8370 Court Ave., Suite 202, Ellicott City, MD 21043. CP (Oct 87)

PageMaker uses a graphics studio metaphor to make this layout ★★★★½ program a natural for pasteup artists. Version 2.0 adds automatic kerning and hyphenation. Still the standard. Excellent documentation. Could use a global search and replace for design elements. $495. Aldus, 411 First Ave. South, Seattle, WA 98104. NCP (Oct 87)

Phoenix 3D is an economical 3D drawing package, with features ★★★★ that belong in a more expensive program. Multiple light sources, fine object placement and orientation control, and a good selection of shapes. $49.95. Dreams of the Phoenix, PO Box 10273, Jacksonville, FL 32247. NCP (Oct 86)

PictureBase is a powerful graphic librarian. You can store paint and ★★★★½ PICT formatted items and attach keywords for later search and retrieval. $69.95. Symmetry, 761 E. University Dr., Mesa, AZ 85203. NCP (Sep 87)

Portfolio: Designs for Newsletters provides over 20 templates for ★★★★ 2-page newsletters with pre-set columns, headlines, graphics and captions. Documentation provides excellent tutorial in page design. Requires 512K+; *PageMaker*. $79.95. Aldus, 411 First Ave. S., Suite 200, Seattle, WA 98104. NCP (May 87)

The Print Shop makes it easy to create greeting cards, signs, ★★★½ banners and letterheads. Uses its own special graphics and can import *Paint* files. Hard disk users get version 1.02 or higher. $79.95. Broderbund, 17 Paul Dr., San Rafael, CA 94903. CP (Sep 87)

QuarkXPress is a high end desktop publishing application. Layout ★★★★★ is done in block format; powerful lining tool ties blocks together. $695. Quark, 2525 West Evans, Denver, CO 80219. NCP (Sep 87)

Ragtime is an "Integrated Page Processor" with text, graphics and ★★★★ built-in spreadsheet. Flow text automatically from one frame to another. Spreadsheet has a full set of functions. Excellent, easy-to-use program. Requires 512K+. $395. Orange Micro, 1400 N. Lakeview, Anaheim, CA 92807. NCP (Apr 87)

Ready, Set, Go! 4 has an elegant interface and excellent manual. ★★★★½ Powerful text wraparounds, fast word processor with hyphenation and spelling check and custom stylesheets. Requires 1M+. $495. Letraset, 40 Eisenhower Dr., Paramus, NJ 07652. NCP (Feb 88)

Scoop could someday be the world's best desktop publishing ★★½ program, but version 1.0 isn't it. There are various ways to cause the program to bomb which need to be fixed. The manual is poorly organized and lacks tutorials. $495. Target Software, 14206 SW 136th St., Miami, FL 33186. NCP (Feb 88)

Slide Show Magician 1.3 is useful for creating full screen audio- ★★★ visual presentations on the Mac. Frame branching, improved editing capabilities, external cassette

MINIFINDERS



recorder synchronization and digitized sound capabilities make this much more powerful than the original. $59.95. Magnum, 21115 Devonshire St., Chatsworth, CA 91311. CP (Mar 86)

Space Edit is a 3D CAD program. Display shows top, front, side and ★★★½ axonometric views of an object, all at once or one at a time. Has standard CAD features plus zoom, exploded view, animated flyover. Suppression of hidden lines is very slow. Requires 1M+. $625. Abvent, 9903 Santa Monica Blvd., Beverly Hills, CA 90212. CP (Jul 87)

Storyboarder produces working animated storyboards for use in ★★★★ film and video production. Imports graphics from *MacPaint;* allows screen masking to simulate television, 35mm or 70mm screen widths; allows limited animation and special effects. $495. American Intelliware, PO Box 6980, Torrance, CA 90504. CP (Nov 86)

SunShine Graphics Library is a collection of 46 400K disks (to ★★★★ date) with a wide variety of high-quality digitized images stored as *MacPaint* files. $20/disk: discount scale for multiple purchases. SunShine, Box 4351, Austin, TX 78765. NCP (Feb 87)

SuperPaint is a powerful, easy-to-use graphics program with ★★★★★ all the best features of *MacPaint* and *MacDraw* — and then some. Among the new features, LaserBits provides 300 dpi magnification and there are 40 editable brush shapes. Requires 512K+. $149.95. Silicon Beach, 9580 Black Mountain Rd., PO Box 261430, San Diego, CA 92126. NCP (Feb 87)

TeXtures (v. 1.0) is an implementation of TeX, the big daddy of ★★★ typesetting programs. Good for people trained on mainframes in the early days. Otherwise very sticky with a high learning curve. Requires 512K+. $495. Addison-Wesley, Jacob Way, Reading, MA 01867. NCP (Apr 88)

VideoWorks II is an easy-to-use animation tool — the best avail- ★★★★½ able on the Mac. Has an Overview mode that acts as a slide show carousel for presentations. Works in color on the Mac II. $195. Requires 1M+ and an 800K drive. MacroMind, 1028 W. Wolfram, Chicago, IL 60657. NCP (Mar 88)

WetPaint consists of two 3-disk volumes of very high quality clip ★★★★★ art. Also includes the *Art Roundup* DA, the best art browser/editor yet. Volume 1 or 2, $39 each; both volumes, $59. Available in *PictureBase* format for $15 extra per volume. Dubl-Click Software, 18201 Gresham St., Northridge, CA 91325. NCP (Sep 87)

World-Class Fonts! comes in two volumes of three disks each. ★★★★½ Includes all the *Mac the Knife* fonts and a lot more, including 2 useful utilities. This is now the best collection of ImageWriter fonts available. Each volume: $39; both volumes: $59. Dubl-Click Software, 18201 Gresham St., Northridge, CA 91325. NCP (Dec 86)

COMMUNICATIONS

AppleShare is the long awaited file sharer from Apple. Software- ★★★★ based, *AppleShare* requires you to dedicate a Mac and a hard disk to run it. Allows users on the network to protect things from other users on the folder level. Interface to network is provided at a revised *Finder.* $799. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP (May 87)

ComServe allows you to share a Hayes-compatible modem over an ★★★★ AppleTalk network. You can call out, but you can't call in. Works with most telecommunications packages. $195 per server. Infosphere, 4730 SW Macadam Ave., Portland, OR 97201. CP (Feb 88)

Desktop Express is a simple to use, semi-automated program for ★★★½ using MCI Mail and Dow Jones News/Retrieval. Performance is traded off for ease of use. Requires 512K+. $149. Dow Jones, PO Box 300, Princeton, NJ 08543. NCP (Jan 88)

HomePak is a package consisting of *HomeTerm,* an excellent, sim- ★★ ple telecommunications program with strong macro features; *HomeFind,* an electronic filer as bad as *HomeTerm* is good; and Apple's *Edit,* a simple, non-HFS-compatible text-file editor. $49.95. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. NCP (Sep 86)

inBox is an easy-to-use mail system. It's called up from a desk ★★★★½ accessory. Has a very slick interface. Dedicated Mac not required. $350 for starter set which includes one Administrator disk and three Connection disks. Additional Connections cost $125 each. Think Technologies, 135 South Rd., Bedford, MA 01730. NCP (May 87)

inTalk comes with its own communications command language ★★★★½ able to do unattended sessions. Supports Xmodem and MacBinary. Has a macro key function. Many sample setup documents and command language files provided. $195. Palantir, 12777 Jones Rd., Houston, TX 77070. NCP (Prem)

MacTerminal provides basic telecommunications and terminal em- ★★½ ulation for the Mac user. Doesn't have macros nor any sort of auto redial/auto logon capability. Best for those needing faithful VT100 or IBM 3278 emulation — it is superb at those. $125. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP (Prem)

Microphone is a high-powered terminal program that's easy ★★★★½ enough for novices. Very powerful command language allows full automation of communications, if desired. $149. Software Ventures, 2907 Claremont Ave., Berkeley, CA 94705. NCP (Jul 86)

Microsoft Mail is an electronic mail system that runs under Apple- ★★★★½ Talk. Supports file transfers across the mail system. Full online help facility. Also includes "While you were out" messages. Desk accessory based. Prices determined by number of users licensed. One to four users, $299.95; 5 to 10 users, $499.95; 11 to 20 users, $749.95; 21 or more users, $949.95. Microsoft, 16011 NE 36th Way, Redmond, WA 98073-9717. NCP (May 87)

Red Ryder is a full-featured telecommunications program that sup- ★★★★★ ports MacBinary, Xmodem and Kermit. Has big screen support, auto procedure creator and up to 30 keyboard macros. This is the cream of the crop (in late 87). $80. Freesoft, 150 Hickory Dr., Beaver Falls, PA 15010. NCP (Dec 87)

Smartcom II balances power and ease of use. Capable of unattend- ★★★★½ ed operation and has a very powerful command language. Supports MacBinary, Xmodem and Hayes Verification protocols. The large screen buffer can easily be archived. $149. Hayes, 5923 Peachtree Industrial Blvd., Norcross, GA 30092. NCP (Jul 86)

Telescape is the power telecommunicator's terminal program. Can ★★★ be configured to emulate any terminal. The documentation does not adequately explain the many features. $125. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. NCP (Jun 86)

TOPS is a file server that is designed to network computers with ★★★★½ different operating systems. The current system will support Macs, MS-DOS compatibles and UNIX. Access to files and subdirectories is transparent to the user; they appear as Mac folders. Only handles ASCII or Text files. $149 for Mac version. $389 for PC's (comes with add-on card). TOPS, 2560 Ninth St., Berkeley, CA 94710. Serial number protected. (May 87)

VersaTerm features include DEC VT100 and VT52, Tektronix 4014 ★★★★½ graphics terminal and Data General DG200 emulation. Supports Xmodem and *MacTerminal* Xmodem protocols and MacBinary. *VersaTerm* is easy to use and well documented. $99. Peripherals, Computers & Supplies, 2457 Perkiomen Ave., Mt. Penn, PA 19606. CP (Prem)

VersaTerm-Pro is a very powerful terminal program with several ★★★★½ special features. Does one of the best VT100 emulations

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available and specializes in high-quality Tektronix 4014 and 4105 emulation. A pro's tool. Requires 512K+. $295. Peripherals, Computers & Supplies, 2457 Perkiomen Ave., Mt. Penn, PA 19606. NCP (Apr 87)

WORD PROCESSORS

Document Compare allows users to compare any two *MacWrite* ★★★ 4.5, ASCII or MDS documents. Differences in spelling, punctuation, formatting and wording are detected. Documents can be printed out with differences highlighted. $99. Legalware, 33 Young St., Toronto, Ontario M5E 1S9, Canada. NCP (May 86)

Document Modeler can automate much of a professional office's ★★★★½ correspondence. Comes in two parts: *Template Maker* and *Document Maker.* Initial setup requires time and is complex. $299.95. Legalware, 33 Young St., Toronto, Ontario M5E 1S9, Canada. NCP (Mar 87)

Doug Clapp's Word Tools is a useful punctuation and style editing ★★★★ program. It won't turn you into a Proust, but it will help you make your writing cleaner and clearer. Word counts among different formats show discrepancies, but not to worry. Requires 512K+. $79.95 Aegis Development, 2125 Pico Blvd., Santa Monica, CA 90405. NCP (Sep 87)

Expressionist is a powerful DA that allows you to create complex ★★★★★ mathematical equations from within an application. Equation manipulation has never been easier. $79.95. Allan Bonadio Associates, 1579 Delores St., San Francisco, CA 94110. NCP (Jul 87)

JustText is a professional level word processor and page makeup ★★★★½ program that generates PostScript output. Comes with a set of LaserWriter utilities that allow total manipulation of art and text. Requires LaserWriter or other PostScript compatible output device. $195. Knowledge Engineering, GPO Box 2139, New York, NY 10116. NCP (Dec 85)

Kadmos Greek Font is a full character set of ancient Greek that ★★★½ prints on any PostScript printer. Requires learning new typing skills, but excellent quality makes it worth the effort. Allotype Typographics, 1600 Packard Rd., Ann Arbor, MI 48104. NCP (Oct 87)

Laser Author is a high-powered, technically oriented word proces- ★★★½ sor. Good math setting capability. Has style sheets, word count and page layout capability. $199.95. Firebird Licensees, PO Box 49, Ramsey, NJ 07446. NCP (Mar 87)

Liberty Spell Checker is a fast, effective interactive checker. The ★★★½ dictionary is smaller than average, but well chosen. Unfortunately, it has a few misspelled words. $59.95. Data-Pak, 14011 Ventura Blvd., Sherman Oaks, CA 91423. CP (Oct 86)

Lookup is an on-call, quick single word spelling checker. Designed ★★★★★ for the way writers really work. Uses the 93,000+ word *Spellswell* dictionary. $49.95. Working Software, 321 Alvarado, Suite H, Monterey, CA 93940. (Dec 87) NCP

MacGAS is a DA spelling checker with both a small and extended ★★★ dictionary. Its best point is the excellent thesaurus, provides antonyms & glossary. A slow checker. $99. EnterSet, 2380 Ellsworth, Berkeley, CA 94720. CP (Oct 86)

MacProof is a grammar, style and spelling checker that's like hav- ★★★★½ ing your own personal copy editor. Grammar rules are fixed, and you may not agree with the choices. The program only suggests corrections, it doesn't make them for you. And the checking process can be slow if your document is long. $195 for standalone version; $2500 for networked version. Automated Language Processing Systems, 190 West 800 North, Provo, UT 84604. NCP (Apr 87)

Macspell+ (version 1.10) is a spelling checker that installs as a ★★★★ desk accessory. Works easily with *MacWrite* 4.5 and 2.2 and *Word,* but has some drawbacks. New version just available. Requires 512K+, two drives or hard disk. $99. Creighton Development, 16 Hughes St., Irvine, CA 92718. NCP

MacWrite is the basic Mac word processor. While it doesn't have ★★★★ every bell and whistle, it is more than adequate for most users. Features include global search and replace, page numbers indicated in the scroll bar and excellent LaserWriter compatibility. $125. Claris, 440 Clyde Ave., Mountain View, CA 94043. NCP

MergeWrite is a mail merge program for *MacWrite* (also works with ★★★½ ASCII files). Program combines names and addresses from a data file into predefined fields in a form letter. Also allows simple conditional IF-THEN-ELSE equations. $49.95. Soft-

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MINIFINDERS



ware Discoveries, 137 Krawski Dr., South Windsor, CT 06074. NCP (Dec 87)

MindWrite integrates outlining and word processing better than anyone. Version 1.1 fixes many problems of the earlier version. Sophisticated search and select options. Unimpressive speed. $295. Access Technology, 555C Heritage Harbor, Monterey, CA 93940. NCP (Feb 88)

QUED/M (v. 2.01) is an excellent text editor that saves documents in a form readable by most computers and printers. Doesn't support graphics or multiple fonts. Programming language allows creation of data base. $129. Paragon Concepts, 4954 Sun Valley Rd., Del Mar, CA 92014. NCP (Mar 88)

QuickWord is a word processing accessory that adds sophisticated glossaries to *MacWrite*. Simple to install and use, yet powerful and efficient. $49.95. EnterSet, 2380 Ellsworth, Berkeley, CA 94720. NCP

Scriptor is designed for producing standard format scripts. Starts with a *Word* document. As you change your *Word* document, *Scriptor* will reformat, renumber and reprint the script. Supports LaserWriter and daisywheel printers. $295. Screenplay Systems, 348 E. Olive Ave., Suite F, Burbank, CA 91502. NCP (May 87)

Spelling Champion is a fast and accurate batch-type spelling checker. Backup feature allows you to undo corrections in a paragraph. Works only with *MacWrite* 4.5. $39.95. Champion Software, 6617 Gettysburg Dr., Madison, WI 53705. NCP (Oct 86)

Spellswell is an effective and powerful standalone spelling checker. It has many advanced features such as capitalization and homonym checking and comes with a large, well-chosen dictionary. Very good dictionary, good value. $74.95. Working Software, 321 Alvarado, Monterey, CA 93940. NCP (May 86)

Thunder! is one of the best spelling checkers around. Features Learned Words (a superb glossary) and statistics. A very fast DA, it works interactively and in selection mode. Requires 512K+. $49.95. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. NCP (Dec 86)

Word 3.01 fixes many of the bugs of the justly maligned 3.0. Still, it's the most feature-laden word processor around. Also has Microsoft's somewhat unusual view of what the Mac interface is. Esoteric command key combinations. Requires 512K+. $395. Microsoft, 16011 NE 36th Way, Redmond, WA 98073. NCP (Mar 88)

WorksPlus Spell is a speedy spelling and hyphenation checker for *Microsoft Works*. It includes a glossary for abbreviations and time/date stamping. The biggest drawback is its limitation to one program. $59.95. Lundeen & Associates. PO Box 30038, Oakland, CA 94604. NCP (Oct 87)

WriteNow for the Macintosh has many of the features of *MacWrite* and then some, including the ability to work in columns. Has built-in spelling checker with 50,000-word dictionary. $175. T/Maker, 1973 Landings Dr., Mountain View, CA 94043. NCP (Mar 87)

SYSTEM SOFTWARE

HyperCard is a totally unique program for the Mac. It uses an index card metaphor. It contains a programming language, HyperTalk. Requires 1M+. Free with new Macs, otherwise $49.95. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP (Dec 87)

System Tools 5.0 is the Apple System upgrade for Mac Plus, SE and II owners. It contains *MultiFinder* (a multitasking environment), a LaserWriter spooler, and a Control Panel resource to add color on the Mac II desktop. Takes 1M+. $49. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP (Mar 88)

ORGANIZATIONAL TOOLS

Acta is an outline processor in desk accessory format. It has practically all the power of a standalone program, and then some. Can save files as *Acta* outlines, *MacWrite* or text files. $59.95. Symmetry, 761 E. University Dr., Mesa, AZ 85203. NCP (Jul 86)

Business Class is a *HyperCard* stack that contains world travel information and itinerary planning. Uses maps to locate countries of interest, but it lacks United States domestic travel information. Requires 1M+ and *HyperCard*. $49.95. Activision, 2350 Bayshore Pkwy., Mountain View, CA 94043. NCP (Mar 88)

Calliope is a new type of outlining program. Chunks of information are manipulated as small "light bulbs" containing text. Related elements can be graphically connected, and their text information viewed in hierarchical order. Text files can be created for *MacWrite* editing. $99. Innovision, PO Box 1317, Los Altos, CA 94023. NCP (Sep 86)

Comment (previously known as *Memorandum*) is the electronic equivalent of Post-it Notes. Notes can be attached to many different types of documents. Doesn't work well with *SuperPaint* or *Microsoft Works*. An alarm clock feature alerts users of Timed Notes. $99.95. Deneba Systems, 14206 SW 136th St., Miami, FL 33186. NCP (Nov 87)

DecisionMap organizes data to facilitate decision making. Unique weighting abilities make this a powerful tool. The decision analysis process is long and sometimes complex, but never difficult. $145. SoftStyle, 7192 Kalanianole Hwy., Honolulu, HI 96825. CP

Design is a powerful organizational tool. It goes beyond mere flowcharting. Complex, detailed program aimed at software pros. $250. Meta Software, 150 CambridgePark Dr., Cambridge, MA 02140. NCP (Apr 87)

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Focal Point is a *HyperCard* stack that ties together a calendar, phone log, client accounts and more in one easy-to-use organizational tool. Requires 1M+ and *HyperCard*. $99.95. Activision, 2350 Bayshore Pkwy., Mountain View, CA 94043. NCP (Mar 88)

Guide allows you to "cross reference" from within a document using hypertext. You can set up words or sections of the document so that double-clicking brings up explanatory material, graphics and other useful items. The word processing and formatting functions, however, are limited. $135. OWL International, 14218 NE 21st St., Bellevue, WA 98007. NCP (Apr 87)

Instant Expert is an excellent way to learn the mechanics of creating an expert system. The inference engine (that ultimately finds the answer) is visible. Lacks a true Mac interface. Version 1.0. $49.95. Human Intellect Systems, 1670 S. Amphlett Blvd., Suite 326, San Mateo, CA 94402. NCP (Jan 88)

MacProject allows a user to plan and track a project from beginning to end. Uses CPM to produce schedules with start and finish dates for each task. Can report on resource interdependencies and generate all needed printed reports. $195. Claris, 440 Clyde Ave., Mountain View, CA 94043. NCP (Mar 86)

MacSMARTS can create small standalone expert systems. Features hypertext connections to Paint, PICT, SYLK and text files. Still a little buggy. Requires 512K+. Version 1.03. $149.95. Cognition Technology, 55 Wheeler St., Cambridge, MA 02138. NCP (Jan 88)

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faster than the original. Includes a font menu. Even saves reports out in *MacDraw* format for further work. Uses standard print drivers. HFS compatible. $495. Micro Planning International, 235 Montgomery St., San Francisco, CA 94104. NCP (Dec 86)

MORE is an incredibly powerful outline processor with gobs ★★★★★ of great features: instant charts, math capabilities, multiple windows, font and style control, templates and more. Prints outlines in any of several standard formats, even in color. Requires 512K+. $295. Living Videotext, 117 Easy St., Mountain View, CA 94043. NCP (Jan 87)

PowerPoint is a comprehensive presentation creation tool. Han- ★★★★ dles 35mm slide and overhead transparency formats. Good graphics and text editing capabilities. Requires 512K+. $395. Microsoft, 16011 NE 36th Way, Redmond, WA 98073-9717. NCP (Aug 87)

ThinkTank 512 is a very fast and intuitive organizational tool. Full ★★★ keyboard control is possible. Can store and paste graphics into outlines. Slide show feature allows high-quality presentations to be created. Good report formatting and printing capability. $195. Living Videotext, 117 Easy St., Mountain View, CA 94043. CP (Jan 86)

DESK MANAGERS

Executive Office is a jack of all trades office application. Good data ★★★½ base, word processing, graphics and minispreadsheet. Available on 400 or 800K disks; get the 800 if you can. $249.99. DataPak, 14011 Ventura Blvd., Sherman Oaks, CA 91423. CP (Mar 87)

Front Desk lets small businesses and offices easily keep track of ★★★ personnel schedules, activities and payments. The program can keep track of up to 15 employees, functioning as a day-, week- and month-at-a-glance calendar. $149.95. Layered, 529 Main St., Boston, MA 02129. NCP (Dec 85)

MockPackage+ is a set of extremely powerful DAs. Includes a text ★★★★½ editor, text printer (supports LaserWriter), charter, terminal and EZmenus. HFS compatible. $35. CE Software, 801-73rd St., Des Moines, IA 50312. NCP (Mar 87)

My Office lets you handle your files and papers in much the same ★★★★ way you did before you got a computer. Excellent use of graphic symbols. $129.95. DataPak, 14011 Ventura Blvd., Sherman Oaks, CA 91423. CP (Prem)

Quickset is a set of desk management and organizational tools that ★★★ can be used as desk accessories or applications. Functions include note filer, card filer, calendar, phone dialer, financial and statistical calculators and a file encryptor. $49.95. EnterSet, 2380 Ellsworth, Berkeley, CA 94720. NCP (Dec 85)

SideKick 2.0 beefs up original *SideKick* DAs and adds two major ★★★★ new ones — *MacPlan*, (formerly *Click-On Worksheet*) and *Outlook*, a full-featured outliner. Also comes with seven applications to support the desk accessories. $99.95. Borland International, 4585 Scotts Valley Dr., Scotts Valley, CA 95066. NCP (Jun 87)

Smart Alarms is the best reminder system for the Mac. Easy to use, ★★★★½ versatile and, well, smart. This self-running DA automatically reminds you of anything you enter into its Reminder file,

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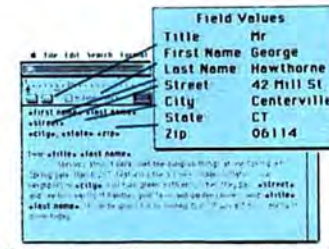
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Top Desk is a set of 7 self-installing (and self-removing) DAs. *Menu Key* adds Command key sequences to programs; *View* allows looking at and moving data between up to 8 *MacWrite* documents; also included are *BackPrint, Touch 'n' Go, Blank, Encrypt* and *Launch*. $59.95. Cortland Computer, PO Box 9916, Berkeley, CA 94709. NCP (May 86)

UTILITIES

Accessory Pak 1 is a set of useful applications and utilities. *Paint Cutter* alone is worth the price. That program allows users to browse and manipulate full page *MacPaint* documents. $39.95. Silicon Beach, PO Box 261430, San Diego, CA 92126. NCP (Nov 85)

AutoSave DA is insurance against system crashes. It saves your work automatically at intervals from 1 to 99 minutes. Compatible with many applications, but not recommended for use with data bases. $49.95. Magic Software, 1706 Galvin Rd. S., Bellevue, NE 68005. NCP (Jan 88)

Colorizer adds pigments to the desktop and black and white applications. Also colors PICT graphics. System resources include saving and printing color screens. A useful novelty that'll run its course as developers add color to apps. Requires Mac II. $49.95. Palomar Software, PO Box 2635, Vista, CA 92083. NCP (Jan 88)

Copy II Mac does efficient sector and bit copies and in its latest version can back up virtually all Mac software. Features graphic displays of copy progress. Comes with *MacTools*, a multi-use utility that can recover many damaged files. $39.95. Central Point Software, 9700 SW Capitol Highway, Portland, OR 97219. NCP (Apr 86)

DiskExpress unfragments disk volumes by reorganizing data into continuous sectors and arranging files to slow down further fragmentation. Works with *MacServe*, floppy drives and most hard drives. Requires 512K+. $39.95. ALSoft, Box 927, Spring, TX 77383. NCP (Feb 87)

DiskFit is a utility for backing up and restoring hard disk files. Creates a "SmartSet" of floppy disks so incremental backups only update files modified since the last backup procedure. Backs up to floppies or another hard disk. Requires 512K+. $74.95. SuperMac Software, 295 N. Bernardo Ave., Mountain View, CA 94043. NCP (Jun 87)

DiskQuick is an easy-to-use cataloging program. Criteria selection option for generating subcatalogs. Requires 512K+. $49.95. Ideaforms, P.O. Box 1540, Fairfield, IA 52556. NCP (Apr 87)

Disk Ranger is a speedy cataloging program that doubles as an efficient labelmaker. Comes with pinfeed labels. Works with regular and hard disks. Can catalog HFS systems. $34.95. Graham Software, 8609 Ingalls Circle, Arvada, CO 80003. NCP (Mar 86)

DiskTop is a desk accessory *Finder* replacement of extraordinary power and ease of use. Comes with the useful *LaserStatus* DA and *Widgets* application. The extras alone are worth the

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price. Requires 512K+. Upgrade from version 1.0, $7; $10 with new manual. $49.95. CE Software, 801 73rd St., Des Moines, IA 50312. NCP (Aug 87)

DiskTools Plus is a set of 8 useful DAs and applications. Earlier ★★★★★ version was sold as *Battery Pak*. The DA *Disk Tools II* is a *Finder* replacement. Also included are an RPN calculator, *Phone Pad* and *Calendar Manager*. Requires 512K+. $49.95. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. NCP (Mar 88)

Dubl-Click Calculator Construction Set lets users design person- ★★★★½ alized calculators with a variety of standard and special functions. Finished calculators can be saved as installable desk accessories or as clickable applications. $59. Dubl-Click Software, 18201 Gresham St., Northridge, CA 91325. NCP (Apr 86)

Easy Checks puts your check register (or credit card records or any ★★ other simple financial account) into a desk accessory. Creating formats is rough, can't save reports to disk and there's no LaserWriter support. Requires 512K+. $44.95. PAR Software, PO Box 1089, Vancouver, WA 98666. NCP (Apr 88)

Eureka: The Solver is a free-form numerical equation solver. Stand- ★★★ ard trigonometric and logarithmic functions are available as is treatment of imaginary and complex numbers. $195. Borland International, 4585 Scotts Valley Dr., Scotts Valley, CA 95066. NCP (Mar 88)

Fastback for the Macintosh is a hard disk back-up software that is ★★★ very quick if not very efficient. Doesn't automatically exclude applications. Creates a seperate catalog disk. $99.95. Fifth Generation Systems, 1322 Bell Ave., Tustin, CA 92680. NCP (Apr 88)

Fedit Plus is the file and disk editor for everyone, from newest Mac ★★★★★ owner to oldest. It can do more for your disks and files than any other application. Can recover deleted MFS files. If you own a Mac, get it. HFS-compatible. $49.95. MacMaster Systems, 108 E. Fremont Ave., #37, Sunnyvale, CA 94087. NCP (Sep 86)

Findswell is an indispensible utility that installs a new button in the ★★★★★ Open Dialog box of virtually every Macintosh application. Press the button, type a search string, press Find and *Findswell* searches for any files that match. Click Open or double-click to open the correct file. Requires 512K+. $49.95. Working Software, 321 Alvarado, Monterey, CA 93940. NCP (Nov 87)

FlashBack is a utility to back up HFS hard disks onto floppies. A ★★★ unique graphic display of the HFS directory facilitates file selection. The program can handle files larger than 800K. $59.95. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. NCP (Nov 86)

Glue adds a print-to-disk capability to many programs. *ImageSaver* ★★★★½ installs as printer driver; *Viewer* allows copying and printing of *Glue* files. Handy utility for desktop publishers. $59.95. Solutions International, Box 989, Montpelier, VT 05602. NCP (Dec 86)

Hard Disk Util uses patch files to allow users to mount and run ★★★★½ specified programs on their hard disks. The list of patches is constantly expanding. $89.95. FWB Software, 2040 Polk St., San Francisco, CA 94109. NCP

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HFS Locator Plus is *the* essential HFS desk accessory. It can ★★★★ search for a file by name or date of creation, create folders, move files from one folder to another, set a program to launch while in an application. $39.95. PBI Software, 1163 Triton Dr., Foster City, CA 94404. NCP (Sep 86)

Icon-It! (v. 1.0) lets you create icons to use as an alternative to ★★★★½ menu commands. Comes with 47 icon templates or you can create your own. *MultiFinder*-hostile. $79.95. Olduvai Software, 7520 Red Rd., South Miami, FL 33143. NCP (Feb 88)

LabView automates the repetitive task of controlling laboratory ★★½ instruments. Rich icon-based language allows flow chart type programming, but response is slow. Requires 512K+. $1995. National Instruments, 12109 Technology Blvd., Austin, TX 78727. NCP (Aug 87)

LaserServe is a printer spooler for AppleTalk networks. After instal- ★★★★★ lation all operations done via a desk accessory. Works with both *MacServe* and *TOPS.* Requires 512K+ and 800K drive or hard disk. $95 per node. Infosphere, 4730 SW Macadam Ave., Portland, OR 97201. NCP (Feb 87)

Mac Disk Catalog II is a utility that will quickly organize a ★★★★ moderate size disk library. Easy to use with powerful reporting and label-making features. $49.95. New Canaan MicroCode, 136 Beech Rd., New Canaan, CT 06840. NCP (Dec 85)

MacFlow is a design tool created for programmers. Traditional flow- ★★★½ charting symbols are linked together, and a symbol can be connected to a separate flowchart file. Symbols can't be edited, precluding using *MacFlow* for other applications. $125. Mainstay, 5211-B Derry Ave., Agoura Hills, CA 91301. NCP (Apr 87)

MacInUse tracks time spent in applications and saves info as text ★★★★★ files. Installs on any disk, works in background. MFS, HFS compatible. Extremely valuable for tax purposes, client records, etc. $79. SoftView, 4820 Adohr Lane, Camarillo, CA 93010. NCP (Jan 87)

MacLabeler lets users instantly index and print labels for all the ★★★½ disks in a burgeoning collection. Choose border type and orientation of your label; index by folder or document. Starter set of labels is included. $49.95. Ideaform, PO Box 1540, Fairfield, IA 52556. NCP (Prem)

MacNosy is a global disassembler. A very advanced user can use ★★★★★ this program to look into the code of virtually any program. This advanced tool can take you places no other Mac program could dream of going IF you have the skill to guide it. The documentation is sparse. For pros only. $90. Jasik Designs, 343 Trenton Way, Menlo Park, CA 94025. NCP

Mac + II lets you run Apple II software on the Mac. Emulation speed ★★★ is only 35 to 45 percent of a real Apple II, so graphics especially suffer. Games also run slow. Runs *AppleWorks* (Apple II integrated software). Good for ex-Apple II owners who have large software collections. $149.95. Meacom, PO Box 272591, Houston, TX 77277. CP

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Does not work with PC graphics programs or with network programs. Requires DOS 3.0 or later and Apple System 3.2 or later. Macintosh is a trademark of Apple Computer, Inc. IBM is a registered trademark of International Business Machines Corp.

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MINIFINDERS

MacSafe is a data file security program that allows you to place ¢¢¢¢ multiple files into a "safe," and then you can further protect them through two types of encryption (including DES). Flexible and very easy to use. Allows for installation on hard disk. $149.95. Kent Marsh Ltd, 1200 Post Oak Blvd., Houston, TX 77056. CP (Mar 87)

MacServe converts a Mac and a hard disk into a disk and print ¢¢¢¢½ server. Uses the AppleTalk network and is easily hooked up. Users can partition the hard disk into multiple volumes. Runs in the background, so users can work on all machines in the network. $250. Requires 512+ or Mac XL. Infosphere, 4730 SW Macadam, Portland, OR 97201. CP

MacTree displays your files in the form of a hierarchical tree. Good ¢¢ idea, poor performance. Can't view tree easily. Good search function. Requires 512K+. $69.95. Software Research Technology, 22901 Mill Creek Dr., Laguna Hills, CA 92653. NCP (Apr 88)

MacZap is a three-part disk and memory utility. It can be used to ¢¢¢¢ recover some damaged files and disks, compare disks, analyze disk structure and make back-up copies of most disks. $60. Micro Analyst, 2505 Roxmoor, Austin, TX 78723. NCP (Jan 86)

Menu Fonts displays the names of fonts in the actual font instead of ¢¢¢ standard Chicago. Won't work with programs that have a nonstandard Font menu or no Font menu. Comes with *Lock-Out*, a utility that gives password access to your Mac, and *FastFormatter*, a utility for formatting multiple blank disks. Requires 512K+. $15. Beyond Software, 3865 N. Oracle Rd., Tucson, AZ 85705. NCP (Jul 87)

myDiskLabeler is an excellent label maker. It can read directories ¢¢¢¢ and use large or small icons or anything desired. Comes with 54 precut labels. $44.95; with color printing ability (on the ImageWriter II), $54.95; with PostScript font capability (on the LaserWriter), $64.95. Williams and Macias, PO Box 19206, Spokane, WA 99219. NCP (Aug 87)

'Ncryptor is a simple, safe program that lets users password their ¢¢¢¢ files. The same program is used for encoding and decoding. This is one of the best products in its category. $39.95. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. NCP

PackIt III is an essential utility. Primarily used to temporarily "glue" ¢¢¢¢½ files together, it can also compress and encrypt. Feeware. $10, $10 for printed manual. Harry R. Chesley, 1850 Union St., San Francisco, CA 94123. NCP (Jan 87)

PowerStation is an extremely easy to use, versatile and powerful ¢¢¢¢¢ *Finder* substitute. Loaded with power user features. Comes with *Pyro!* $59.95. Software Supply, 599 N. Mathilda Ave., Suite 210, Sunnyvale, CA 94086. NCP (Dec 87)

Printworks for the Mac is a comprehensive software-based dot-¢¢¢¢ matrix printer control system. Optimizes printing from different applications, and is easy to use. Requires 512K+. $75. SoftStyle, 7192 Kalanianaole Hwy., Honolulu, HI 96825. NCP (Aug 87)

Programmer's On-line Companion puts an abridged version of ¢¢¢ *Inside Macintosh* in your system for reference. Simply read the text or transfer some or all of it directly into your normal editing window. Non-Macish interface makes the program confusing, somewhat difficult to use. $34.95. Addison-Wesley, Route 128, Reading, MA 01867. NCP (Jul 87)

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RamSnap is a RAMdisk and disk cache in one easy-to-use pack-
★★★★ age. Can store multiple configurations as files. Good product but a little pricey. $59.95. Dove Computer Corp., 1200 North 23rd St., Wilmington, NC 28405. NCP (Jun 87)

Read-it! (v. 1.0) is the best consumer value in optical character
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Sentinel encrypts data files (or sets of files) using a super-secure
★★★★ DES or a super-fast SuperCrypt algorithm. Provides high-level security if you can keep your passwords secret. Requires 1M+. $149.95. SuperMac, 295 N. Bernardo Ave., Mountain View, CA 94043. NCP (Apr 88)

SmartScrap and The Clipper are two useful desk accessory utili-
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SoundWave is a useful sound recording and editing utility. Works
★★★★ with waveforms; able to change sampling rates. Previously known as *SoundCap*. $199.95. Impulse, 6870 Shingle Creek Parkway, Minneapolis, MN 55430. NCP (Apr 88)

Stepping Out is a software virtual screen extender. Lets you create
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Suitcase is a transparent program that automatically lets you use
★★★★★ all your fonts and DAs. Foolproof and indispensible. Comes with *Pyro!*, the best screen saver. Requires 512K+. $59.95. Software Supply, 599 N. Mathilda, Sunnyvale, CA 94086. NCP (Nov 87)

SuperLaserSpool is a LaserWriter spooler. Very fast because
★★★★ it does conversion to PostScript in the background, but doesn't print a faithful rendition of *PageMaker* documents as a result. $149.95 single user, $395.95 for up to five users on one network. SuperMac Software, 950 N. Rengstorff Ave., Mountain View, CA 94043. NCP (Jun 87)

Switcher is Andy Hertzfeld's contribution to Mac productivity. This
★★★★★ program lets users run several programs at once (up to 8 on a 1-megabyte or larger machine). Switching between the programs is nearly instantaneous. Requires 512K+. $19.95 from Apple, free from BBSs, included with some

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MINIFINDERS



third-party applications. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP (Jun 86)

Tempo is a desk accessory that allows most Mac commands to be intelligently recorded and played back. Capabilities include pausing, conditional branching and macros that work between applications. $99. Affinity Micro Systems, 1050 Walnut St., Boulder, CO 80302. NCP (Jul 86)

TMON is *the* debugger for the Mac. This isn't open to question. *TMON* is simply the best. Comes with the latest version of Darin Adler's Extended User Area. $149. ICOM Simulations, 626 Wheeling Rd., Wheeling, IL 60090. NCP

Turbo Download is a desk accessory designed specifically to increase the speed of Xmodem data transfers from national data bases to your Mac. Speed increases range upward from 50% to over 300% at 2400 baud. $39.95. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. NCP

Twelve-C Financial Desk Accessory brings all the power and functionality of a Hewlett-Packard 12C programmable calculator to your desktop. Can be programmed and all registers can be viewed while calculator is running. $39.95. Dreams of the Phoenix, PO Box 10273, Jacksonville, FL 32247. NCP

II in a Mac is a graphically oriented Apple II emulator with unique features, such as text and graphics copy from Apple screen to Mac Clipboard. Suffers speed problems associated with "virtual machine" emulation. $69. Micro-W Distributing, 1342B Route 23, Butler, NJ 07405. CP

TypeNow is a desk accessory that allows the Mac and ImageWriter to function as an electronic typewriter. Type can be placed into blanks in complex forms easily. Typing can be recorded and played back. $39.95. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. NCP (Jan 86)

LANGUAGES

AAIS Prolog is a fast standard Prolog with excellent debugging and error handling. Good for serious program development. Documentation is not as good as the program. $150. Advanced AI Systems, PO Box 39-0360, Mountain View, CA 94039-0360. NCP (Mar 87)

Aztec C is a C language that will appeal to users with a UNIX background. It uses many UNIX conventions and in the more expensive versions comes with standard UNIX utilities, including the VI editor. $75 beginners, $199 basic system, $299 development system, $499 commercial system. Manx Software Systems, PO Box 55, Shrewsbury, NJ 07701. NCP (May 86)

Basic Compiler is the long awaited compiler for *Microsoft BASIC*. The interface is unfriendly, but it gets the job done. Compiled programs run faster, but you can still tell they are written in BASIC. $195. Microsoft, 16011 NE 36th Way, Redmond, WA 98073-9717. NCP (May 87)

ExperCommon Lisp is a LISP development system. Not fully Common LISP compatible, but creates good compiled code and standalone applications. Requires 1M+. $995. ExperTelligence, 559 San Ysidro Rd., Santa Barbara, CA 93108. NCP (Aug 87)

ExperLISP is a useful programming language for high-level programmers. The more you use it, the more you'll figure out

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about it. $495. Requires 512K+. ExperTelligence, 559 San Ysidro Rd., Santa Barbara, CA 93108. CP

ExperLogo is a version of the popular teaching language, Logo. ♦♦♦ Features three-dimensional graphics using "bunnies" rather than usual "turtles." Very speedy, smooth program. Comes with an excellent manual. $149.95. ExperTelligence, 559 San Ysidro Rd., Santa Barbara, CA 93108. CP

ExperProlog II is a Prolog based on the new Prolog II standard. Has ♦♦♦ the ability to handle infinite trees and allows user-defined functions that operate conditionally. Documentation is not the best and Mac interface is nonstandard. $495. ExperTelligence, 559 San Ysidro Blvd., Santa Barbara, CA 33108. NCP (Mar 87)

Lightspeed C provides an integrated environment for developing ♦♦♦♦½ desk accessories, applications and code resources in C. The editor works with the compiler for searches and file management. Can get awkward if you need something outside the environment. $175. Think Technologies, 135 South Rd., Bedford, MA 01730. NCP (Apr 87)

Lightspeed Pascal is a fast, powerful development system for ♦♦♦♦♦ Pascal programming. Fully integrated Mac-like environment. Requires 512K+. $125. Think Technologies, 135 South Rd., Bedford, MA 01730. NCP (Feb 87)

LPA MacProlog (v. 2.0) is a much improved program that includes ♦♦♦♦ incremental and optimizing compilers, a graphics environment package and C and Pascal submodules. Requires 1M+. $495. Programming Logic Systems, 31 Crescent Dr., Milford, CT 06460. NCP (Feb 88)

MacAsm is a software development system that allows programs ♦♦♦ to be written in assembly language. Programmers can assemble, edit and test software, and an integrated resource compiler lets independent applications run from their own icons. $125. Mainstay, 5311-B Derry Rd., Agoura Hills, CA 91301. NCP

Mac C is a good, highly Mac-oriented implementation of this popu- ♦♦♦♦ lar development language. Assembler and linker included. $425. Consulair, 140 Campo Dr., Portola Valley, CA 94025. NCP

MacExpress is a development environment or shell. Programmers ♦♦♦ use it to save time and effort when developing standalone applications for the Mac. $195. ALSoft, PO Box 927, Spring, TX 77383. NCP (Feb 86)

MacForth Plus is an excellent implementation of the popular Forth ♦♦♦♦ programming language. New, reduced price, $199. Creative Solutions, 4701 Randolph Rd., Rockville, MD 20852. NCP

Mach II is a multitasking implementation of Forth that allows local ♦♦♦♦ variables and text files. Can create standalone applications. Several windows can be up with different operations in each, operating concurrently. Execution is fast. $99.95. Requires 512K+. Palo Alto Shipping, PO Box 7430, Menlo Park, CA 94026. NCP (Apr 86)

Macintosh 68000 Development System is a fairly traditional as- ♦♦♦♦ sembly language package. The two-disk set provides an editor (*Edit*), an assembler, a linker, an executive and a resource compiler. $195. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP

Macintosh Pascal is Apple Computer's version of this very popular ♦♦♦ programming language. Loaded as it is with innovative teaching features, this interpreter is an excellent introduc-

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tion to Pascal. $125. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. CP

MacScheme is a LISP dialect with "artificial intelligence" capabili-
ℓℓℓ ties. Has a large appetite for RAM. Interpreted language with Toolbox access limited to a small part of QuickDraw. $125. Semantic Microsystems, 4470 S.W. Hall St., Beaverton, OR 97005. NCP (Jun 86)

MacScheme+Toolsmith is a Mac version of Scheme, a LISP dia-
ℓℓℓℓℓ lect. Beautiful implementation, marred only by relative slowness compared to similar products. Get *Toolsmith*. Requires 1M+. $395. Semantic Microsystems, 4470 S. W. Hall, Beaverton, OR 97005. NCP (Aug 87)

Megamax C is an easy to use, full version of C. Has a compiler,
ℓℓℓℓ linker, disassembler, editor and much more. Good for beginners. Excellent documentation. $299.95. Megamax, PO Box 851521, Richardson, TX 75085. NCP

Microsoft BASIC was the Mac's first programming language. This
ℓℓℓℓ interpreter (it's not a compiler) now supports the Toolbox and the whole Mac interface can be implemented in your programs. For nonprogrammers there are lots of programs available. $99. Microsoft, 16011 NE 36th Way, Redmond, WA 98073-9717. NCP

MIDIBasic is a library of simple, but highly useful routines for writing
ℓℓℓℓ MIDI software. Good stuff. Sketchy documentation. Works with both *Microsoft* and *ZBasic*. Requires 512K+ plus BASIC. $49.95. Altech Systems, 831 Kings Highway, Shreveport, LA 71119. NCP (Aug 87)

Object Logo is an object-oriented programming language with ac-
ℓℓℓℓ cess to the Toolbox. Good product, but can't produce standalone applications. Requires 512K+. $79.95. Coral Software, PO Box 307, Cambridge, MA 02142. NCP (Aug 87)

Personal Prolog is an inexpensive and well-documented program.
ℓℓℓℓ Has no debugging or search and replace facilities, making it a more appropriate tool for learning than development. Documentation and use of Mac interface are excellent. $64.95. Optimized Systems Software, 1221 B Kentwood Ave., San Jose, CA 95129. NCP (Mar 87)

Prolog/m is a solid Prolog following the Edinburgh standard. Has
ℓℓℓℓ extensive debugging facilities, but you'll need separate *Toolbox* disk with 58 additional predicates. Drawback: no true editing or printing facilities. $99.95. Chalcedony Software, 5580 La Jolla Blvd., La Jolla, CA 92037. NCP (Mar 87)

QUED (Quality Editor for Developers) is the ultimate source code
ℓℓℓℓ editor. Loaded with useful and well thought out features, it will make any programmer's life much easier. It is not a word processor, however. $65. Paragon Concepts, 4954 Sun Valley Rd., Del Mar, CA 92014. NCP (Mar 86)

TML Data Base Toolkit is an ISAM type data base that provides
ℓℓℓℓ fast and efficient administration of large data files in applications developed with *TML* compiler. Supports multiple open index files. $89.95. TML Systems, 4241 Bay Meadows Rd., Jacksonville, FL 32217. NCP (Dec 86)

TML (MacLanguage Series) Pascal is a good Pascal compiler,
ℓℓℓℓℓ capable of producing standalone programs. Can use most existing Lisa Pascal programs with only slight modification. Requires 512K+. $99.95. TML Systems, 4241 Bay Meadows Rd., Jacksonville, FL 32217. NCP (Jun 86)

TML Source Code Library shows how to write programs that use
ℓℓℓℓ½ custom definition routines, speech, serial drivers, split bars and other topics. Provided on three 400K diskettes. Requires *TML Pascal*. $79.95. TML Systems, 4241 Bay Meadows Rd., Jacksonville, FL 32217. NCP (Dec 86)

Visual Interactive Programming is a unique visual programming
ℓℓℓℓ system for creating simple Macintosh applications. Programs are constructed in a flowchart-type manner. Easy access to most toolbox routines. Poor printing control. $124.95. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. NCP (Jun 87)

ZBasic is a fast, interactive compiler capable of creating standalone
ℓℓℓℓ applications that take advantage of Mac's unique features and abilities. Includes *Edit, RMaker* and *MacInTalk*. Requires 512K+. $89.95. Zedcor, 4500 E. Speedway Blvd., Tucson, AZ 85712. NCP (Dec 86)

EDUCATION

Business Simulator is a training tool in a simulation game. Make
ℓℓℓℓ decisions that manage the company through several stages over 25 years. Decisions become more difficult over time. Requires 1M+, 2 disk drives (one must be 800K). May be run from a hard disk. $69.95. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. NCP (Dec 87)

ChipWits is a combination game and teaching tool. Players create
ℓℓℓ½ programs to maneuver robots through a set of 8 mazes. The programs are written in *ChipWit's* built-in icon-based programming language (IBOL). $49.95. BrainPower, 24009 Ventura Blvd., Calabasas, CA 91302. NCP

Course Builder (version 2.0) creates standalone educational appli-
ℓℓℓℓ cations. An easy-to-learn dedicated programming language uses blocks and arrows. Graphics, animation and sound can be integrated. Version 2 allows mathematical calculations. Poor documentation. $395, plus $10 shipping. TeleRobotics International, 8410 Oak Ridge Highway, Knoxville, TN 37931. NCP (Oct 87)

HyperTutor is a stack that teaches HyperTalk, *Hypercard*'s pro-
ℓℓℓℓ½ gramming language. Uses an interactive Test Mac on each card to write scripts. A variety of windows makes it good for both beginners and advanced programmers. $49.95. Teligraphics, 936 Sir Francis Drake Blvd., Kentfield, CA 94904. NCP (Apr 88)

KidsTime is a package of five quality educational programs for
ℓℓℓℓ children between the ages of 3 and 12. The programs all have adjustable difficulty levels. Some use speech and one is a nice introduction to musical notes. Sparse documentation. $49.95. Great Wave, 5353 Scotts Valley Dr., Scotts Valley, CA 95066. NCP (Oct 86)

LearnWord 3.0 is a three-part series of cassette tape/diskette
ℓℓℓ½ modules that explain the intricacies of *Word* 3.0. They do the job, but remind you why cutting classes was more fun. $49.95 per module. Personal Training Systems, PO Box 54240, San Jose, CA 95154. (Apr 88)

MacEdge and **MacEdge II** each contain 8 reading or math drill
ℓℓℓ programs for basic skills. Programs follow one of three formats, a bit contrived. Contrivances are design flaws. $49.95 each. Think Educational Software, 16 Market St., Potsdam, NY 13676. CP

MacType offers structured typing instruction. Can teach both
ℓℓℓℓ standard and Dvorak keyboards. Features include certificates for reaching certain levels. Can be used in a multistudent environment. $49.95. Palantir Software, 12777 Jones Rd., Houston, TX 77070. CP

MasterType is proof that learning to type can be fun. In this arcade-
ℓℓℓ style action game words descend from four corners towards the center ship; the user must type them correctly. Features 18 skill levels, tracks errors, recommends lessons and provides comparison scores. $49.95. Mindscape, 3444 Dundee Rd., Northbrook, IL 60062. CP

Sensei Physics is a capable, intelligent, well-designed study aid.
ℓℓℓℓ½ Covers Vectors to Thermodynamics to The Nature of Light. Animated experiments let you try out concepts. Requires 512K+. $99.95. Broderbund Software, 17 Paul Dr., San Rafael, CA 94903. CP (Jan 88)

Subli-Mac is a self-hypnosis program, combining subliminal, relax-
ℓℓ½ ation and positive-self-image techniques. Flashes a brief user-written message (against a diversionary pattern) at your subconscious. Dangerous near hard disks. Manual suf-

MINIFINDERS 

fers from terminal California-ese. $39.95. Psy-Den, PO Box 248, Champlain, NY 12919. NCP (Jan 88)

ENTERTAINMENT

A Mind Forever Voyaging is a departure in text adventure games. It ★★★ has a more extensive vocabulary and a more involved story than most of the genre. The story here is gripping, but there are only a few puzzles to solve. Requires 512K+. $39.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. NCP (Apr 86)

Alter Ego simulates the entire lifetime of a fictional character. The ★★★★ player's reaction to each multiple-choice event shapes the character's future relationships, job, health, etc. Spectacular the first time you play; after that there are too many similarities to previous characters. $59.95. Activision, PO Box 7287, Mountain View, CA 94039. CP (Jun 86)

The Ancient Art of War gives users a chance to refight some ★★★★½ famous campaigns on both strategic and tactical levels. Campaigns can also be designed from scratch. Very playable, addicting game. Requires 512K+ Mac. $44.95. Broderbund, 17 Paul Dr., San Rafael, CA 94903. CP (Apr 86)

Archon pits the forces of Light against Dark in a quest to gain control ★★★★½ of five Power Points on a checkerboard grid. The shifting cycles of squares' colors keep the balance of power ever-changing. One or two players. $39.95. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. CP (Oct 86)

Balance of Power is the world's first computer peacegame. This ★★★★★ simulation allows players to become either the President of the United States or General Secretary of the Soviet Union. Extraordinary artificial intelligence routines and general play make this a classic. $49.95. Mindscape, 3444 Dundee Rd., Northbrook, IL 60022. CP (Prem)

Battle Stations is a deceptively simple game based on the pen and ★★★★ paper game of *Battleship*. Requires strategy on several levels. Makes excellent use of Mac sound and graphics. Fun, casual game, especially when the Mac is one of the players. Requires 512K+. $30. Timeline, PO Box 60, Ypsilanti, MI 48197. NCP (Jun 87)

Beyond Zork is yet another installment in the famous *Zork* series of ★★★★½ text adventures. Find the fabled Coconut of Quendor to restore failing magic in this expert-level game. On-Screen mapping and the Mac's window environment are taken advantage of. $49.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. NCP (Apr 88)

Borrowed Time casts players as detectives who have to solve their ★★★★ own murder — before it happens. This game requires players to think and act like a detective to solve the game. Good sentence parser, sketchy Mac interface. $44.95. Activision, PO Box 7287, Mountain View, CA 94039. CP (May 86)

Bridge 4.0 provides three other players and the cards for a game of ★½ rubber bridge. It's an average (Goren) bidder and a less than good card player. Good if it's the only game in town. Plays slowly since it's written in BASIC. $29.95. Artworx Software, 150 N. Main St., Fairport, NY 14450. CP (Sep 86)

Bureaucracy is a paranoiac text adventure that dares you to move ★★★½ to a new house and job and still maintain some degree of sanity, not to mention a low blood pressure. Written by Douglas Adams of *Hitchhiker*'s fame. $39.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. NCP (Aug 87)

The Chessmaster 2000 is a masterful chess program that will ★★★★★ appeal to both novices and master. You can view the board from 2- or 3-D perspective and turn the board for a better look. Play is smooth and easy, and the program responds by voice. You may get tired of hearing "Gotcha," though. $39.95. The Software Toolworks, 13557 Ventura Blvd., Sherman Oaks, CA 91423. CP (Jul 87)

Crystal Quest combines all the good elements of nearly every video ★★★★½ game ever made. Move a piece around to gobble up points and crystals. Shoot the nasties and get through the goal before they get you. Excellent sound effects. In color on the Mac II. Requires 512K+. Greene, 15 Via Chualar, Monterey, CA 93940. CP (Apr 88)

Dark Castle is an outstanding achievement in action games which ★★★★★ integrates RealSound with superb animation and graphics. You'll need better-than-average hand/eye coordination, but it's well worth the effort. Requires 512K+. $39.95. Silicon Beach, PO Box 261430, San Diego, CA 92126. NCP (Apr 87)

Deja Vu: A Nightmare Comes True is a graphic adventure that ★★★★★ breaks new ground. Innovative use of the Mac interface in truly playable and exciting game. A great introduction to graphic adventure games. $49.95. Mindscape, 3444 Dundee Rd., Northbrook, IL 60062. CP (Jan 86)

Dinner at Eight is a useful recipe filing system that includes a ★★★★ collection of recipes from a nationwide sampling of restaurants. Users enter number of diners and program scales recipes. $49.95. Rubicon, 2111 Dickson Dr., Austin, TX 78704. NCP (Jan 86)

Down Hill Racer is an action game with three skier personalities, ★★★★ four courses and four skill levels. There's something here for every player, no matter how bad or good. Full digitized sound (very nice!) $49.95. Miles Computing, 7741 Alabama Ave., Canoga Park, CA 91304. CP (Sep 87)

Enchanted Scepters is a surround sound graphic adventure game. ★★★★ It has a limited vocabulary and virtually no story. Offers extensive and varied scenes and utilizes the Mac interface to the fullest. $39.95. Silicon Beach, PO Box 261430, San Diego, CA 92126. CP (May 86)

Ferrari Grand Prix is an exciting race car simulation game. Master-★★★★ ing it takes quite a bit of time and effort. Startup course and four other courses are built into the program. You can also design your own courses and backgrounds. Requires 512K+. $59.95. Bullseye Software, PO Drawer 7900, Incline Village, NV 89450. CP (Jul 87)

Flight Simulator puts you at the controls of a small plane (prop or ★★★★ jet) and lets you roam North America. As difficult as real flying. Mac version has features not found on earlier versions, including spotter aircraft. Not all features available on 128K. $49.95. Microsoft, 16011 NE 36th Way, Redmond, WA 98073-9717. CP (Nov 86)

Fokker Triplane is about as near to flying as you can get seated in ★★★★ front of a computer. Very realistic simulation and excellent graphics. Well designed and implemented. $59.95. Bullseye Software, PO Drawer 7900, Incline Village, NV 89450. CP (Feb 86)

Gato puts players in command of an American submarine in World ★★★★½ War II. This superb simulation game uses all of the Mac's graphic capabilities to really make you feel that "you are there." $49.95. Spectrum HoloByte, 2061 Challenger Dr., Alameda, CA 94501. CP (Nov 85)

Grand Slam is an absorbing and realistic tennis simulation game. ★★★★ Practice or play tournament against Mac-controlled players with different styles and abilities on four different surfaces. 512K or Mac Plus. $49.95. Infinity Software, 1331 61st St., Emeryville, CA 94608. CP (Nov 86)

Handwriting Analyst produces a personality profile base ★★★★½ on answers to questions about one's handwriting. It's simple and the results will amaze and astound. $49.95. Ciasa, 2017 Cedar St., Berkeley, CA 94709. NCP (Apr 88)

HardBall is a baseball simulation game complete with umpire's ★★★★ calls and crowd sounds. Great graphics and a lot of fun for fans. $44.95. Accolade, 20813 Stevens Creek Blvd., Cupertino, CA 95014. CP (Feb 87)

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Hollywood Hijinx substitutes a modern Hollywood estate for the famous Underground Empire, but otherwise represents a return to *Zork* gameplay and feel. There's even a maze to navigate. Simplistic, but good. $39.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. NCP (Jun 87)

Klondike 3.3 is a version of solitaire that uses video game-like scoring to create a superb, totally addictive game. Simple to play, nearly impossible to stop playing. Shareware: $10. Unison Software, 415 Clyde Ave., Mountain View, CA 94043. NCP (Dec 87)

Leather Goddesses of Phobos is another in the long line of witty and entertaining Infocom text adventures. This one lets you choose your sex and comes with a 3D comic and a scratch 'n sniff card. It has three levels of play: tame, suggestive and lewd. $39.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. NCP (Feb 87)

Lode Runner is a 150-screen action-strategy challenge. Move around a grid of ladders and platforms collecting treasure; dig a hole to trap pursuers. Build your own challenges. $39.95. Broderbund, 17 Paul Dr., San Rafael, CA 94903. CP

MacCourses adds four very challenging new courses to *MacGolf.* Courses are swapped on the original *MacGolf* master disk two at a time. Nice add-on for a good game. Requires *MacGolf.* $34.95. Practical Computer Applications, 1305 Jefferson Hwy., Champlin, MN 55316. CP (Apr 87)

MacGolf is a dynamic simulation of real golf. Players have a choice of courses and difficulty levels. Superb playability makes this a must for all golfers and gamers. Requires 512K+. $59.95. Practical Computer Applications, 1305 Jefferson Hwy., Champlin, MN 55316. CP (May 86)

MacMan is a two-part package. The software portion is a decent *PacMan*-like game. The hardware part is a tiny converter that lets you use a joystick with a Mac or Mac Plus. $39.95. Nuvo Systems, 225 Tank Farm Rd., San Luis Obispo, CA 93401. CP (Aug 87)

Mac Pro Football is a terrific sports simulation that gives you the chance to pit any combination of 38 Super Bowl teams against each other and direct team play. It comes with excellent, detailed (and necessary) documentation. Play selection can get a bit Byzantine. $49.95. Avalon Hill, 4517 Harford Rd., Baltimore, MD 21214. CP (Mar 87)

MacRacquetball uses digitized videos and sounds of professional players for a realistic simulation. Has lots of control settings and can be played against someone else over a modem or between hard-wired Macs. Turn off hard disks before playing. $59.95. Practical Computer Applications, 1305 Jefferson Hwy., Champlin, MN 55316. CP (Oct 87)

Make Millions is a fascinating business simulation in which the player competes against the computer to take control of five companies, then run them profitably. Appeals to the closet capitalist in all of us. $49.95. Scarborough Systems/Mindscape, 3444 Dundee, Northbrook, IL 60062. CP

Maze Survival challenges players to destroy maze walls before roving bugs squash themselves against it. Bugs lay eggs to spawn a new generation. Repetitive. $34.95. Olduvai Software, 7520A Red Road, South Miami, FL 33143. NCP (Aug 87)

MazeWars+ is an interactive, multiplayer game to be played on AppleTalk or through a modem link. Chase opponents through a four-level maze. Requires 512K+, AppleTalk or Hayes compatible modem. $49.95. MacroMind, 1029 W. Wolfram, Chicago, IL 60657. NCP (Nov 86)

MicEdGames is a collection of five educational games, MicAlphabetize, MicTime, MicStates, MicMatch and MicSpell, supposedly for ages 5 to adult. Games are sometimes cute but generally poorly designed. Manual is poorly written. Some entertainment value. $19.95. MicEdWare, 4265 Midland Rd., Saginaw, MI 48603. NCP (Dec 87)

Mind Over Mac features five games. Entertainment for the whole family. Good graphics paired with synthesized sound and on-screen help. $49.95. Think Educational Software, 16 Market St., Potsdam, NY 13676. CP (Feb 86)

MoonMist is an introductory level text adventure game. This is a typical haunted English castle story, not quite up to Infocom's best. It has four versions, so it's good for more then one play. $39.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. NCP (May 87)

MSFL: Pro League Football is a professional football league simulation that encourages people to play people, not the machine. Fast with lots of stats. Quirky MS-BASIC behavior. Spotty manual. No LaserWriter support. Requires 1M+. $49. MicroSports, PO Box 15799, Chattanooga, TN 37415. NCP (Apr 88)

NewGammon is animated backgammon that will challenge even good players. Features include variable skill levels and strategies and options to play the Mac or watch the Mac play itself. An arcade-like high speed mode is included. $39.95. Newsoft, PO Box 3046, Newport Beach, CA 92663. CP

NFL Challenge simulates coaching and watching professional football. Comes on two disks, one with program and *System,* the other statistical data. Play against either human or computer coaching. Plays are selected from pre-defined playbooks. $99.95. XOR Corp., 5421 Opportunity Ct., Minnetonka, MN 55343. NCP (Jun 87)

Ogre is a strategy tank game played on a hexagon grid. The ogre is an intelligent cybertank out to smash your command post. Customize your defense. Exceptionally good Mac interface. Has two-player option. $30. Origin Systems, 136 Harvey Rd., Building B, Londonderry, NH 03053. CP (Nov 87)

Orbiter puts a real space shuttle on the Mac screen. A multitude of controls, intelligent on-board computer with speech capabilities, real-time graphics and 16 distinct missions help this program succeed as both a game and a simulation. $49.95. Spectrum HoloByte, 2061 Challenger Dr., Alameda, CA 94501. NCP (Jul 86)

Orbquest is a fantasy role-playing adventure with better-than-average puzzles and an excellent sense of humor. Not as sophisticated as some, but a good value. $49.95. QWare, PO Box 850415, Richardson, TX 75085. CP (Dec 86)

Patton vs. Rommel is a traditional-style strategic war game. It covers events in Normandy in 1944. While complex, it's well designed and very playable. $39.95. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. CP (Apr 87)

The Pawn is an unusual British interactive adventure game with text and graphics. The unique interface has some drawbacks, but *The Pawn* has humor, social satire, is entertaining and is challenging. $44.95. Requires 1M+. Firebird, PO Box 49, Ramsey, NJ 07446. CP (Mar 87)

Pinball Construction Set lets users create their own pinball games, as elaborate or as easy as desired. Uses *MacPaint* for backgrounds and has lifelike sounds (on 512K+ Macs). $39.95. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. CP (Jan 86)

Plundered Hearts brings gothic romance to interactive fiction in the familiar Infocom mode of puzzles, mazes and riddles. You play a 17th century heroine dodging pirates to rescue her wrongly imprisoned father. Medium difficulty. $39.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. CP (Jan 88)

Portal is an intriguing science fiction novel for kids that suffers from having a poor interface. Storyline: All of humanity is missing and you have to search through a data base for files that reveal the mystery. Nothing in the way of role-playing, and the Mac version is slow and buggy. $49.95. Activision, PO Box 7287, Mountain View, CA 94039. CP (Oct 87)

MINIFINDERS



Puppy Love is a combined game and teaching tool. As you teach
★★★★½ your puppy tricks and routines, you learn the basics of programming logic. Great fun for all ages. Does not run from a hard disk. $29.95. Addison-Wesley, Route 128, Reading, MA 01867. CP (Mar 87)

Quarterstaff (v. 1.2) is a fantasy adventure game of the typical
★★★★ "good vs. evil" variety. Ability to use characters in other adventures gives this game a lot of potential for development. Requires 1M+. $49.95. Simulated Environment Systems, 800 South Pacific Coast Hwy., Redondo Beach, CA 90277. NCP (Mar 88)

Real Poker is five-card draw against five other players with Old West
★★★★½ names, distinct personalities and playing styles, in a saloon setting. Dealing and play are very fast. Game evaluates your hand. $39.95. Henderson Associates, 980 Henderson Ave., Sunnyvale, CA 94086. CP

Seven Cities of Gold is an educational program masquerading as
★★★★ an adventure game and is practically unique in being equally good in both respects. You are to land (not the easiest part) in the New World and attempt to placate the natives, seed a few missions and collect gold. Nice work if you can get it. $39.95. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. CP (Jun 87)

Shadowgate is an icon-based graphic adventure. You, as the seed
★★★★½ of prophecy, must save the world from the evil warlock. Far surpasses all others with great animated graphics, sound and adventure. $49.95. Mindscape, 3444 Dundee Rd., Northbrook, IL 60062. CP (Dec 87)

Shanghai challenges players to clear a board of all 144 tiles by
★★★★★ matching pairs of mah-jongg tiles and removing them. Terrific strategic options plus the ability to randomly generate new game boards keep this one fresh. $44.95. Activision, PO Box 7287, Mountain View, CA 94039. CP (Nov 86)

Skyfox is a sophisticated 3D shoot-em-up. You're fighting tanks,
★★★ planes and enemy cities floating in the sky. Fast graphics, good sound, slick, on-board attack computer and many levels of difficulty will keep fans of this genre happy for hours. $39.95. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404. CP (Oct 86)

Smash Hit Racquetball is an accurate and entertaining simulation
★★★★½ of a day on the courts. Digitized sound adds to the realism. Includes a hard disk install, unusual for a game. The low price makes this the perfect Mac gift. $19.95. Primera Software, 650 Cragmont Ave., Berkeley, CA 94707. CP (Dec 86)

Snake-Bar lets you guide a snake (or train or semi) through a maze
★★★★ picking up objects that feed and make your snake grow. Options include changing languages, editing the maze and an X-rated game. $15. (shareware). Georges Malamound, 37 Bis rue des Abbesses, Montmartre, 75018 Paris, France. NCP (Dec 87)

Space Quest is a three-dimensional, animated adventure in which
★★★★ you play a janitor in a dicey situation. All you have to do is get off your ship before it explodes and save the Earnon System. Runs on any Mac. $49.95 Sierra On-Line, PO Box 485, Coarsegold, CA 93614. CP (Sep 87)

Stationfall is the sequel (finally) to Infocom's excellent *Planetfall*
★★★★½ text adventure. Reunited with Floyd and sent to pick up requisition forms, you must solve the empty space station problem. As straightforward as other Infocom games; more so than some. $39.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. NCP (Nov 87)

Strategic Conquest Plus challenges you to discover an unexplored
★★★★½ world and conquer it by manufacturing and deploying armies, ships and planes. A two-disk game that doesn't support an external drive. Requires 512K+. $59.95. PBI Software, 1111 Triton Dr., Foster City, CA 94404. CP (Feb 88)

Sub Battle Simulator is a superior naval combat game. Sixty differ-
★★★★ ent missions and the ability to link missions keep it from ever getting boring. Requires 512K+. $39.95. Epyx, PO Box 8020, Redwood City, CA 94063. CP (Aug 87)

Tass Times in Tone Town is a slightly off-the-wall graphic adven-
★★★½ ture in which you need a flashy hairdo and a jumpsuit before you can get anywhere, and you pay for things with guitar picks. Decent puzzles, with a sense of humor. $44.95. Activision, PO Box 7287, Mountain View, CA 94039. CP (Jan 87)

The Toy Shop is a construction kit for building 20 different working
★★★★ model toys. Some parts can be customized. Manual gives clear instructions, but many toys are too complex for a child. $49.95. Broderbund, 17 Paul Dr., San Rafael, CA 94903. CP (Nov 86)

Trust & Betrayal: The Legacy of Siboot requires negotiating with
★★★★½ 6 artificial personalities in a struggle for power — not surprising considering that it comes from the maker of *Balance of Power.* Uses hieroglyphics to communicate in a fantasy world. Requires 512K+. Mindscape, 3444 Dundee Rd., Northbrook, IL 60062. CP (Mar 88)

Ultima III allows up to four characters to cooperate to explore the
★★★★½ vast wilderness of Sosaria. $59.95. Origin Systems, 340 Harvey Rd., Manchester, NH 03103. CP

Uninvited is an icon-based adventure game set in an extremely
★★★★★ haunted mansion. Since you access the parser by double-clicking, command choices are always visible — you don't waste time trying to figure out which words the program understands. It has animation and sound. $49.95. Mindscape, 3444 Dundee, Northbrook, IL 60062. CP (Sep 86)

Winter Games lets up to eight players compete against each other
★★★★ in Olympic events including figure skating, bobsledding, biathlon and ski-jumping. Excellent animation, good graphics, good theme music. $39.95. Epyx, 600 Galveston Dr., PO Box 8020, Redwood City, CA 94063. CP (Mar 86)

Wizardry is an outstanding dungeon exploration adventure pitting a
★★★★★ party of up to six characters against the guardian monsters of the evil wizard Werdna. Capture his amulet to earn your reward. Even after solving the game, you'll want to go back into the dungeon. $59.95. Sir-Tech, Charlestown-Ogdensburg Mall, PO Box 245, Ogdensburg, NY 13669. CP

WordPlay is a word game with over 50 crossword puzzles for differ-
★★★★ ent levels of expertise. User friendly, it offers on-screen Help menus. A Work mode allows development of new puzzles for the creative. $49.95. Palantir, 12777 Jones Rd., Houston, TX 77070. NCP (Mar 86)

World Builder is an adventure game construction set with what
★★★★½ amounts to its own programming language. The whole program (language included) is easy to learn and produces commercial quality games. No support for the programming language, though. $79.95. Silicon Beach, PO Box 261430, San Diego, CA 92126. NCP (Apr 87)

Xyphus is a role-playing game pitting four characters (fighters or
★★★★ wizards) against multiple scenarios that grow increasingly harder. Excellent Mac interface and icon control. $39.95. Penguin, PO Box 311, Geneva, IL 60134. CP

Your Personal Poet creates personalized greeting cards on the
★★★½ Mac. Comes complete with four greeting cards and matching envelopes. Does not run when connected to a LaserWriter. Requires 512K+. $29.95. Computer Poet Corp., PO Box 7707, Incline, NV 89450. NCP (Jun 87)

Zork II is where the adventure continues in the underground em-
★★★★½ pire. A wandering wizard keeps things interesting, though there's a way to beat him if you persevere. $44.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. NCP

Zork III is the final chapter in the trilogy. Players come up against the
★★★ ultimate enemy — the Dungeonmaster himself. More closed-ended than previous *Zorks.* $44.95. Infocom, 125 CambridgePark Dr., Cambridge, MA 02140. NCP

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MINIFINDERS



MUSIC

ConcertWare+ is an enhanced version of *ConcertWare*. Has ★★★★ different instruments and can use any four of a set of eight at any point in a piece. Can read and use *ConcertWare* and *MusicWorks* files. $69.95. Great Wave Software, 5353 Scotts Valley Dr., Scotts Valley, CA 95066. NCP (Nov 85)

ConcertWare+MIDI is a composition and transcription program ★★★★ that can record multiple notes from a MIDI keyboard. Easy to use if you read music. Handles 8 tracks of 8 voices each. Requires 1M+. Version 4.0. $149.95. Great Wave Software, 5353 Scotts Valley Dr., Scotts Valley, CA 95066. NCP (Dec 87)

Jam Factory is a program for performing complex manipulations on ★★★ MIDI data in real time. Unique, entertaining and very powerful, but requires lots of patience and practice. Requires 512K+, MIDI interface and MIDI synthesizer. $189. Intelligent Computer Music Systems, PO Box 8748, Albany, NY 12208. CP (Oct 87)

Listen is an educational tool for ear training. It has both a piano ★★★★ keyboard and a guitar fretboard for the student to input notes, and offers a wide range of exercises. $99. Resonate, PO Box 996, Menlo Park, CA 94026. (Jan 87)

M is a music composition and creation program that works with MIDI ★★★ data in real time. Unique, entertaining and very powerful, but requires lots of patience and practice. Requires 512K+, MIDI interface and MIDI synthesizer. $219. Intelligent Computer Music Systems, PO Box 8748, Albany, NY 12208. CP (Oct 87)

Master Tracks Pro is a full-featured, second-generation MIDI se- ★★★½ quencer that adheres to the Mac interface very well. It's the first program to have graphic control editing. Needs patch chasing for professional use, but it's still a rock-solid program. $350. Passport Designs, 625 Miramontes St., #103, Half Moon Bay, CA 94019. CP (Dec 87)

MIDIBasic is a simple, but highly useful routine for writing MIDI ★★★★ software. Good stuff. Sketchy documentation. Works with both *Microsoft* and *ZBasic*. Requires 512K+ plus Basic. $49.95. Altech Systems, 831 Kings Hwy, Shreveport, LA 71119. NCP (Aug 87)

Music Mouse is a music program in a genre all its own. Called an ★★★★★ "intelligent instrument," *Music Mouse* gives you instant musical feedback as you move the mouse and type on the keyboard, which controls tempo, vibrato, volume, etc. $59.95. OpCode Systems, 444 Ramona St., Palo Alto, CA 94301. NCP (May 87)

Performer (v. 2.2) is the definitive MIDI sequencer, and is priced ★★★★ accordingly. Includes looping, SMPTE synching, 32 simultaneous Ins and Outs, unlimited overdubbing and compatibility with *Professional Composer* for transcription. Requires MIDI interface and 512K+. $395. Mark of the Unicorn, 222 Third St., Cambridge, MA 02142. CP (Jan 88)

Practica Musica uses an interactive, game and practice approach ★★★★ to teach music theory and ear training. Excellent training tool for the serious music student, it is also fun for anyone who wants to develop a trained ear for intervals, chords and melodies. Requires 512K+. $125. ARS Nova Software, P.O. Box 40629, Santa Barbara, CA 93140. NCP (Nov 87)

Professional Composer produces performance-quality sheet mu- ★★★½ sic using Adobe's Sonata font. Scores can be created from scratch or imported from *Performer* (and can be exported to *Performer* for MIDI playback). Requires 512K+. $495. Mark of the Unicorn, 222 Third St., Cambridge, MA 02142. CP (Jan 88)

Studio Session consists of two programs, an Editor and a Player, ★★★★½ that produce music with six voices of digitized sound. Excellent program plus good manual make this a good buy. $89.95. Bogas Productions, PO Box 6699, Terra Linda, CA 94903-0699. NCP (Aug 87)

HARDWARE & ACCESSORIES

AST TurboScan is a 300 dpi scanner with sophisticated graphics ★★★★ software. Scans at resolutions from 72 to 300 dpi. *SuperScan* software offers halftone, line art and mixed modes. "Virtual memory processing" lets you scan images too large to fit in RAM. $1899. AST Research, 2121 Alton Ave., Irvine, CA 92714. Requires 512K+. *SuperScan* software included. NCP (Nov 87)

CMS S-140 SCSI Hard Disk is a very fast, high-capacity SCSI hard ★★★★★ disk with a unity interleave and average access time of 18 msec. Holds 140M. Help, file transfer and tape backup commands built in. *Hard Disk Partition* is a useful DA that comes with a 6 ft. SCSI cable. $2995. CMS Enhancements, 1372 Valencia Ave., Tustin, CA 92680. (Jul 87)

DASCH is an external RAMdisk available in half, 1 and 2M sizes. ★★★ Connects to a serial port. Speeds up operations 200 to 300%. Can be used as a printer buffer. Works with all Macs. 512K, $395; 1M, $450; 2M, $545. Western Automation Laboratories, PO Box 3438, Boulder, CO 80307. (Feb 87)

Data Frame 40XP is a very fast, very quiet 40-meg external SCSI ★★★★ hard drive. Comes with a good and complete set of utility software. About as fast as a SCSI drive can be. Requires SCSI port, 512K+, new ROM. $1899. SuperMac Technology, 295 N. Bernardo Ave., Mountain View, CA 94043.

DaynaFile hooks up to a SCSI drive to read MS-DOS disks in the ★★★★ Mac environment. Use Mac applications to manipulate data created with an IBM PC. Comes in both 5-¼ and 3-½ inch formats. $595 for single floppy. Dayna Communications, 50 S. Main St., 5th Floor, Salt Lake City, UT 84144. (Jan 88)

FX-20 is a good 20-meg external hard drive. Good utility software. ★★★★ Reliable and reasonably quiet. Sits next to Mac, has a large, oddly shaped case. Requires SCSI port, 512K+, new ROM. $1199. General Computer, 215 First St., Cambridge, MA 02142. (Feb 87)

Hard Disk 20SC is Apple's 20-meg SCSI hard disk. Reliable, fairly ★★★★ noisy unit. Good utility software, but no backup yet. Requires cable and terminator ($80). Requires SCSI port, 512K+, new ROM. $1299. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (Feb 87)

Hewlett-Packard ColorPro Graphics Plotter is an eight-pen desk- ★★★ top plotter that requires third party software to drive it. Fonts are limited to an optional Graphics Enhancement Cartridge that requires some BASIC programming. $1295. Hewlett-Packard, 16399 W. Bernardo Dr., San Diego, CA 92127. (Feb 88)

ImageMaker shoots 35mm color slides direct from the Mac. Sup- ★★★★ ports most presentation software. Uses patterns to represent colors. Not fully compatible with the Mac II. Requires 512K+. $4995. *MacDriver* software, $149. Presentation Technologies, 743 North Pastoria Ave., Sunnyvale, CA 94086. (Feb 88)

IS/ONE tablet with **Penworks** software lets you use a corded or ★★★½ cordless pen or mouse and a high-res tablet for precise graphics input. Minor bugs with some applications and DAs. Keystroke macros can be launched from the tablet. Minimal documentation. Requires 1M+. $595 to $1145. Kurta, 4610 S. 35th St., Phoenix, AZ 85040. (Jan 88)

Jasmine Direct Drive 50 is a very quiet 1:1 interleave 50 megabyte ★★★★★ hard drive and one of the fastest SCSI drives around. A small fan keeps it cool, but it's still quiet. $1159. Jasmine Technologies, 555 De Haro St., San Fransisco, CA 94107. (Mar 88)

MINIFINDERS



MacBottom 45 SCSI and Internal Modem has a modem that fits ★★★★½ into the top half of the 45-megabyte SCSI hard drive case. Comes with *HFS Backup* and *Eureka*. Does not work with a Mac II. $1795. Personal Computer Peripherals, 6204 Benjamin Rd., Tampa, FL 33634. (Oct 87)

MacBottom HD21 is a very low (about 2 inches high), external 20-★★★★★ meg hard drive. Fits under the Mac. Very quiet, very reliable. Good utility software, including *HFS Backup*. Requires SCSI port, 512K+, new ROM. $1195. PCPC, 6204 Benjamin Rd., Tampa, FL 33614. (Feb 87)

MacCharlie's components slip around the Mac and convert it into ★★★★ an IBM PC clone. Amazingly, it works well. The enlarged keyboard has a few bugs but is a joy to use. $995. Dayna Communications, 50 S. Main St., Salt Lake City, UT 84144. (Dec 85)

MacIntizer is a graphics tablet and absolute positioning device that ★★★★ replaces the mouse. Various scales are possible. $599. GTCO Corp., 7125 Riverwood Dr., Columbia, MD 21046.

MacLarger is a 12-inch external monitor for 512K machines on up ★★★ to the SE. Displays the same number of pixels as an internal monitor, only one third larger. Bigger and brighter, but less crisp than the Mac's own screen. $449. Power R, 1606 Dexter Ave. North, Seattle, WA 98109. (Apr 88)

Mac-101 is a keyboard alternative that has a good feel to it. Has a ★★★★ keypad, 15 function keys and more. The *101-Keys* desk accessory lets you define macros. Comes in an ADB version for the SE and II. Requires 512K+. $169.95. DataDesk International, 7650 Haskell Ave., Van Nuys, Ca 91406. Software NCP (Apr 88)

MacSnap Plus 2 is a 2M memory upgrade for the Mac Plus. The ★★★★ board has 256 kilobit chips. User installable. Not compatible with existing big screens or internal hard disks, and can't be expanded further. $399. Dove Computer, 1200 North 23rd St., Wilmington, NC 28405. (Jun 87)

MacTable is an elegant Danish worktable that holds a Mac and ★★★★½ printer with room to spare. The 30 inch deep by 60 inch wide table is made of particleboard and must be assembled. Cabinet is optional. Table, $269; cabinet, $129. ScanCo-Furn, PO Box 3217, Redmond, WA 98073-3217. (Mar 88)

MacTablet is a stylus-driven graphics tablet. Users can ★★★★ easily sketch or trace art using this absolute-positioning device. Has a working area the size of the Mac screen. Allows concurrent use of the mouse. $495. Summagraphics Corp., 777 State St. Extension, Fairfield, CT 06430. (Jan 86)

MacTilt/MacTilt SE is a Mac (and external drive) holder that allows ★★★★ a full range of swiveling and tilting. Very strong, this well made unit is also very easy to use. $99.95. Ergotron, PO Box 17013, Minneapolis, MN 55418.

MacVision is a digitizer that uses an ordinary video camera for ★★★★ input. Capable of extremely fine results and special effects. Easy to use and well documented. $349.95. Koala, 269 Mt. Hermon Rd., Scotts Valley, CA 95066.

Magic Digitizer is a hardware digitizer that works with video cam-★★★★ eras. With *LaserMagic* software you can generate 300 dpi images (in PostScript). Requires 512K+. Digitizer with *Magic* software, $399.95; *LaserMagic* software, $49.95. New Image Technology, 10300 Greenbelt Rd., Seabrook, MD 20706. NCP (May 87)

Microtek MSF-300C is a 300-dpi flatbed scanner. Really fast when ★★★½ used with optional MS-SCSI/C adapter. Comes with *VersaScan Plus* software (NCP) to scan and manipulate image. Saves images in a number of formats including TIFF and *MacPaint*. $1895. Microtek Lab, 16901 S. Western Ave., Gardena, CA 90247. (Dec 87)

Migent Pocket Modem is a 300/1200 baud portable modem ★★★½ about the size of a 3 X 5 index card. Comes bundled with *MacTerm* 2.0, Borland's telecom DA. Manual is confusing, and tech support is minimal. $259. Migent, 865 Tahoe Blvd., Incline Village, NV 89450-6062. (Nov 87)

Mouse Mover is a mouse pad-type surface that snaps onto the ★★★★½ bottom of the mouse like a roller skate, freeing it up to glide over desk or mouse pad with ease. 99 tiny ball bearings at three strategic points. Mouse glides faster and saves on mouse wear and tear. $19.95. Magnum Software, 21115 Devonshire St., Chatsworth, CA 91311.

Moustrak is a fabric covered foam mousing pad. It will increase the ★★★★ efficiency of your mouse while helping to keep it clean. Pad comes in a variety of colors. Particularly useful in the typical office desktop environment. $10. Moustrak, 3047 St. Helena Hwy., St. Helena, CA 94574.

NetModem is a 1200-baud modem that can be accessed by all ★★★★ users on an AppleTalk network. The modem's display lights and the dial tone are simulated on-screen. Requires 512K+. $599. Shiva, Suite 1200, 222 Third St., Cambridge, MA 02142-9919. (Feb 88)

NoLabelSystem is a plastic permanent labeling system in which ★★★★ users slide new tabs into a transparent plastic case on the disk. The tabs stick out of the case slightly, making them easier to read while in the drive. $19.45. Weber & Sons, 3468 Hwy. 9, Freehold, NJ 07728.

One Plus One is a user-installable memory upgrade for a Mac Plus. ★★★★½ Adds 1 megabyte of RAM to the 1M already there. Simple one-evening project. Includes MacBreeze, an excellent small fan. Requires Mac Plus. $375. Levco, 6160 Lusk Blvd., San Diego, CA 92121. (Aug 87)

Personal LaserPrinter is a non-PostScript laser printer at a great ★★★★ price. Clumsy workarounds required in some applications. Printing can be slow. Requires 1M+. $1999; Fonts Plus, $299. General Computer, 580 Winter St., Waltham, MA 02154. (Apr 88)

Personal Writer PW15 S is a tablet-based handwriting recogni-★★★★ tion system that also allows graphics and macros. Number of misread characters is too high for general word processing. Requires 1M+. $895. Personal Writer, 1801 Ave. of the Stars, Los Angeles, CA 90067. Software NCP (Mar 88)

PhoneNET is an AppleTalk-compatible network. Network can be up ★★★★★ to 3000 ft in length. In-place, unused phone cabling can be used for network, and can be combined with AppleTalk on same network. $49 per node. Farallon Computing, 2150 Kittredge St., Berkeley, CA 94704. (Dec 86)

SuperRam 2 and SuperRam 4 are 2- and 4-megabyte RAM up-★★★½ grades. Should be dealer installed but can be (carefully) user installed. SuperRam 2 includes RAM adaptor module, 1-meg memory module, modified power cable, jumper and fan. SuperRam 4 adds power supply booster and two 1-meg memory modules. Not compatible with most big screens. $499. SuperMac Technology, 295 N. Bernardo, Mountain View, CA 94043. (Oct 87)

ThunderScan replaces the ribbon cartridge in an ImageWriter, ★★★★ which is required to use it. Laser scans art that can be run through the ImageWriter, producing high-quality digitized images. The images can be manipulated as they are created or afterward. $249. Thunderware, 21 Orinda Way, Orinda, CA 94563.

TimeWand is a bar-code reader with a built-in time/date ★★★★ stamping clock. Can be used with *TimeWand Manager* software, a data base that's extensive though difficult to use. Poor docs, but good support. Requires 1M+. *TimeWand* 2K version, $198; *TimeWand Manager*, $489. Videx, 1105 NE Circle Blvd., Corvallis, OR 97330-4285. (Dec 87)

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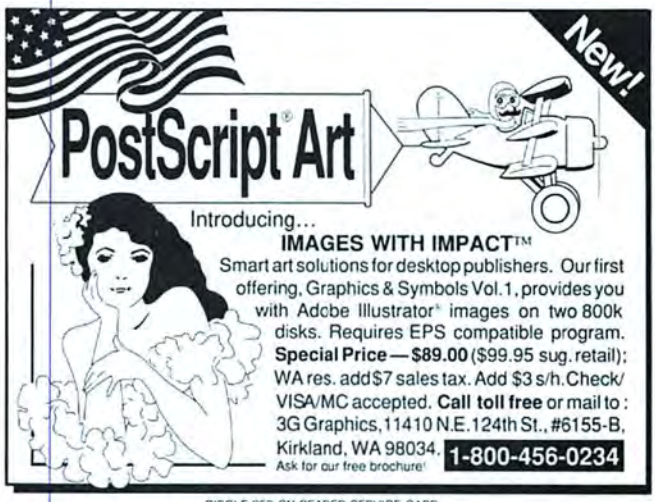
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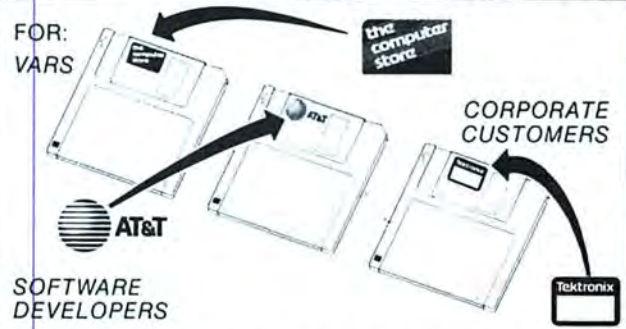
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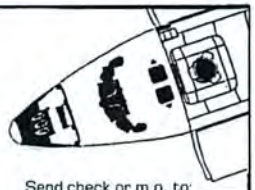
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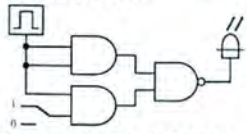
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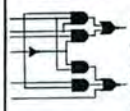
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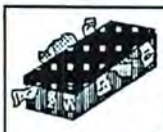
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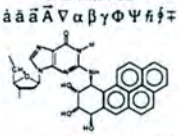
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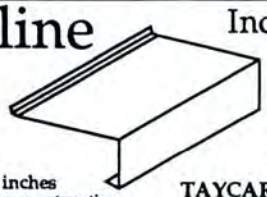
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by John C. Dvorak

Birds of a Feather Flock Together

It isn't as though I *have* to write an April Fool's column every year. It would be hard to top last year's message from the Devil. If you were here last year, the column (1) was written so that (2) if the reader counted backwards seven words from the last word (3) then the reader got a message from the Devil. How could I possibly top that unless I did one of five (4) things. (5) First I could do the same thing as last year and the reader could count backwards starting with the last word. The mystery is how many words (6) should the reader count backwards? Should it be seven (7) like last year's column? Or perhaps eight (8)?

I was unsure of the gambit (9) so I figured I might use a math trick or two (10). Something like scattering throughout the column (11) some, uh, numbers. Yeah, that's the ticket. You read the first or second or third (12) word after the number and then find (13) a message. I thought about it and decided that it was *too* obvious. Perhaps the formula $X = V +$ (length of W) x 3 might mean something where X is the word we're looking for. It's discovered by adding the number in parenthesis (V) to the length (in characters) of the word (W) that follows the number in parenthesis and multiplying that sum by 3. The reader then counts forward that number of words from the number in parenthesis to get the word X. Hint: The word designated as W in the formula is the first word in the count. (14) When I first devised this scheme I figured I had a good (and easy) technique for putting a secret message in the column without having to go through a lot of bull.

Better still, I figured I could write a column that could be read backwards like last year. And forwards skipping seven words for an additional two messages AND still maintain the numbered message within. Ooops. Hold on, I have to say Macintosh right here and IBM. Black box, heathens, devil may care, serendipity and Lulu are all things I have to say right about, uh, uh, now! (15) It's not easy to make THIS WORK!

Then I decided that one of the messages will contain a clue to decoding a hidden and scrambled message. Finally, I gave up on the idea and instead turned to *Playboy* to glance over last year's old John Sculley interview in the September 1987 issue. That's the issue with the smiling, buxom and callipygious Gwen Hajek, a pinup bombshell from Shreveport, Louisiana whose favorite singers are dead and whose ambition is "To live my life to the fullest and to be happy at whatever I'm doing." How original. She likes shopping and her favorite foods include Count Chocula cereal. She's on one page showing us males what's missing in our lives while John Sculley is on another page telling us about Apple computers. Interesting concept. Fascinating juxtaposition.

More than anything else I was amused by the cover of the issue. While *Playboy* had Sculley cornered in what was a significant interview, there was no mention on the cover. I guess they didn't want to take a chance on increasing newsstand sales. Instead the cover highlighted "The Women of 007" (how dull) and a blurb that said "The 1987 Sexy Scandal Test." Okay, so nobody cares about Sculley.

As it turned out, the interview had little to add to what Sculley would finally say (to excess) in his recent memoir. I was entertained by one question and answer, though. Dig this. *Playboy*, roaming off the subject of computers, asks: "What would be the modern day equivalent of the Sputnik crises?"

Sculley, with what I have to assume is a straight face, says: "I think a lot about it. In the next 20 years, about 25 to 30 percent of the teachers are going to retire. ...All of these teachers will retire about the same time that I believe the Soviets will land a manned mission on Mars. And that is the time that it's been estimated that the value of the Japanese stock exchange will exceed the value of all of the American stock exchanges. This combination of events will suddenly wake people up."

Earth to Sculley! Earth to Sculley! Come in. Come in.

I figured that this off-the-wall comment was a little peculiar until I found out that Sculley was going to propose that Apple hire TV alien, Alf, as its director of marketing. Couldn't hurt.

Further in the Sculley interview he was asked about business training in college and whether it's any good. Sculley beats around the bush, concludes college should be aimless and says, "It's very difficult to prepare yourself for what your career may be later on. The paradox is that what I'm doing today is exactly what I thought I wanted to do with my life when I was 12 or 13 — to experiment with neat technologies and be in a very creative intensive job."

I'm so sure — Sculley at the dorky age of 12 or 13 said to himself, "When I grow up I want to be in a creative intensive job, yessir! And maybe I can play with some keen and neat-o technologies too!"

I think if we went back in time we'd hear something more like this:

"Johnny, what do you want to do when you grow up?"

Rocking from one foot to the next little Johnny Sculley looks skyward, then down at his feet, then skyward again. "Gee, maybe a space man! Golly, I'm not sure, I just want to get rid of these pimples and I DON'T WANT TO BE KISSED BY ANY DUMB GIRLS. Yuk!"

If, as a 12-year old, little Johnny Sculley had any profound thoughts about his future, we can be sure the words "creative intensive" weren't in his lexicon. Perhaps he'd say, "I want to live my life to the fullest and be happy at whatever I'm doing."

John meet Gwen Hajek, Playmate of the Month.

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